POPULAR Computing WEEKLY

SPECIAL TAPE OFFER

35p 26 January-1 February 1984 Vol 3 No 4

This Week

Street Life
Graham Taylor interviews Crystal Computing and learns the secrets of its high score tables See page 13

Reviews
David Lawrence looks at the latest programs for the Commodore 64 including *Hovver Bovver* and *Revenge of the Mutant Camels* from Llamasoft See page 14

Dragon
Paul Barnard shows you how to turn your Dragon into a digital clock with a simple machine code routine See page 26

New Releases
This week's releases include *Lords of Time* from Level 9 and *Pi-Eyed* from Automata See page 60

STAR GAME
Bi-plane on Dragon.
See page 10

News Desk

Adam finally comes to Britain

THE Coleco Adam is to be launched in the UK in the first half of this year.

The Adam caused a considerable stir when it was first announced at last summer's Consumer Electronics Show (see *PCW* 23/29 June) It was priced at $600 and included a daisy-wheel 80-column printer, 80K Ram, built-in stringy microfloppy drive and a Rom cartridge slot.

However, production problems delayed the Adam's availability in the US and forced an increase in price.

The Adam will be available first to the UK in the form of Expansion Module 3 which comprises a memory storage unit, keyboard and printer. Added to the Colecovision video games console (the Expansion Module 3 will make up a complete Adam.

The UK price, which will have a large bearing on the Adam's success has yet to be Continued on page 5

Successor for Jack Tramiel

MARSHALL Smith, currently president of Thyssen-Bornemisza will succeed Jack Tramiel as president and chief executive of Commodore on February 21.

The appointment of the 55-year old Mr Smith to Commodore has been widely linked with Jack Tramiel's decision to resign from the company (see *PCW* 19/25 January). Marshall Smith is believed to have refused to accept the Commodore post while Jack Tramiel was still in charge.

Mr Smith joined Indian Head, the US soft drinks bottler and metal parts manufacturer in 1967. Thyssen took over Indian Head in 1974 and Mr Smith was appointed chief executive of the company in 1977. Indian Head was subsequently renamed Thyssen Bornemisza.

Irving Gould Commodore's chairman and largest single shareholder, is credited with persuading Mr Smith to join Continued on page 5

Classified

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BRITAIN'S BEST-SELLING MICRO WEEKLY



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This Week

Editorial

The future of the BBC micro contract is becoming the subject of increasing speculation.

This speculation has been heightened by the recent launch of Sinclair's new QL machine. Indeed, Sinclair himself has made no secret of the fact that he is extremely keen to win the contract, which comes up for renewal in August this year.

However, the BBC would appear to be quite satisfied with Acorn's performance so far. *The Computer Programme* has been sold to numerous countries around the world and the corporation has earned several million pounds in royalties. In addition, the BBC has gained a certain amount of kudos through associating itself with 'a leading edge of technology'.

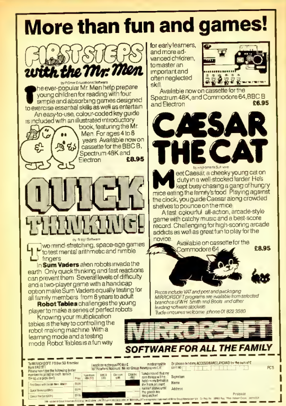
Another factor to be considered is the investment the BBC has made in commissioning books, tv and radio series, and a range of other publications all of which are based around Acorn's machine.

But there is an element at the BBC which is worried about its involvement with such a commercial enterprise. There is also a feeling that Acorn should not be allowed to keep the contract 'in perpetuity' simply because it was successful the first time around.

The chances are that Acorn will retain the BBC contract — but if it should lose out Acorn would find itself in big trouble.

Next Thursday

Try your luck on Bandit — a fruit machine game for 16K and 48K Spectrum by K Deakes, that has all the features of the real thing, except, of course, actually paying out!



More than fun and games!
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by Primer Educational Software
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Robot Tables challenges the young player to make a series of perfect robots.
Knowing your multiplication tables is the key to controlling the robot-making machine. With a learning mode and a testing mode Robot Tables is a fun way
CAESAR THE CAT
Meet Caesar, a cheeky young cat on duty in a well-stocked larder. He's kept busy chasing a gang of hungry mice eating the family's food. Playing against the clock, you guide Caesar along crowded shelves to pounce on the mice.
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Cut-price school offer

COMMODORE has finally come up with its answer to the government's 'micros in schools scheme — a cut-price offer of its own

Deliberately designed to coincide with the end of the government scheme Commodore is offering schools and colleges throughout the UK the chance to buy Commodore 64s complete with 1541 single floppy disc drives, Logo and Simon's Basic for £299 99 per package. This is a saving of £172 over the recommended retail price of £472

But the offer closes on April 30, 1984

Commodore marketing manager John Baxter said the scheme was chiefly aimed at easing the financial burden on schools which have already bought machines under the micros in secondary schools scheme but now require additional equipment

Commodore was understandably upset at being excluded from the 'micros in schools scheme, particularly as its main rivals — Sinclair and Acorn — were both included However the government scheme had a number of drawbacks and some schools preferred to make their own decisions about the choice of microcomputers.

Details of the Commodore offer can be obtained from approved Commodore dealers anywhere in the UK

ZX fair at Ally Pally

THE latest ZX Microfair will be held on Saturday, February 4, at London's Alexandria Pavilion. Tickets will cost £1 for adults and 50p for children (if bought in advance) and £1 25 and 60p on the day

In the palm of your hand

PALMTEX has introduced the first hand-held video game with interchangeable cartridges The PVS, which features colour graphics and eight direction movement, went on sale in the US earlier this month for $49

The cartridges which cost approximately $15 each can be swapped so that a variety of different games can be played Current games include *Aladdin's Adventure*, *ReactAttack* and *Outflank* — another version of the strategy game *Go*

The PVS measures 4¼in by 3½in when closed while the liquid crystal display screen is 2¼in by 1½in

Powered by four 1½ volt batteries, the PVS has 512 addressable pixels and a 4K Rom The cartridges each contain 2K Ram

Pentagon restriction

THE US Pentagon is attempting to restrict the export of 16 bit micros to Warsaw Pact countries

If the US plan is accepted by the EEC, the shipment of any 16 bit micro to an eastern bloc country would require an export licence. More advanced micros, such as Sinclair's recently launched QL, would also be included in the scheme

However, the signs are that the EEC will reject the US plan as being unworkable

Buy-back launch from Acornsoft

ACORNSOFT has launched a buy back system to enable owners of Acornsoft cassette based programs to exchange them for equivalent discs for 50 percent of the usual cost

In the past, most people who bought a BBC disc drive were unable to transfer existing Acornsoft cassette programs on to disc and consequently had to buy a disc copy of the program

This situation, which is a common source of complaint among owners of many micros besides the BBC, is partly remedied by the Acornsoft exchange scheme

If you send Acornsoft your cassette version of any of their programs they will send you the disc equivalent, providing there is one, for half price Thus *Starship Command* which costs £11 50 on disc can be obtained for £5 75 if you send your old cassette version with the money

The deal only covers Acornsoft programs and orders should be sent to Disc Replacement Service, Acornsoft Ltd, c/o Vector Marketing, Denington Industrial Estate, Wellingborough, Northants NN8 2RL.

Acornsoft go champion

GO, an ancient Japanese board game in which black and white stones are strategically placed on a grid, has been the subject of a competition run by Acornsoft

Entrants had to design a computer program to play the game which involves complex and subtle tactics, and take part in a tournament which was held in London over two days – January 7 and 8

The eventual winner was Bronislaw Przbyla (right), a professional programmer who collected the £1,000 prize money from David Johnson Davies of Acornsoft, and earned the title Champion Computer Go player of the world A version of his winning game will be marketed by Acornsoft in the summer

Adam

Continued from page 1

announced

However the Adam will be offering Digital Research's personal CP/M Coleco has agreed to manufacture Digital Research's personal CP/M on both digital data packs and floppy discs

'Personal CP/M is significant as it provides the consumer with an easy to use, easy to understand yet professional operating system explained Ken Harkness, general manager of Digital Research

Commodore

Continued from page 1

the company The two first met in 1978 when Thyssen-Bornemisza acquired Interpool, a shipping container company in which Irving Gould had a financial stake

All lines engaged

THE announcement of the QL — Sinclair's new business machine — has already had a significant effect on the market

Although the machine has only been seen at one press conference, lines to Sinclair's mail order centre in Camberley have been continuously engaged with people trying to order machines

Computer bookshops are experiencing a rush on books about the 68000 processor — the QL uses a 68008 A spokesman for Foyles, which has a large computer book section said 'We sold out within days of the announcement and not only are the books mainly quite expensive American imports, but they're also all about the 68000 which is not the same as the 68008 '

Halls of the Things

I have found some interesting diversions in *Halls Of The Things*. First, to open the door where there is no maze, press 1 then press 2, press Enter and break space. To change the colour do the same but press W instead of 2. Repeat the process to change it back.

By the way, I've collected seven rings, the golden key and killed 232 monsters to score 1 999 points. Can any one help me in *Espionage Island* by telling me what to do with the flight operator?

Kevin Allen
10 Addicott Road
Weston super Mare
Avon

Spectrum Fortran

I am writing to ask if there are any Fortran programs for the Spectrum (48K) on the market, as I am told that this is the best language to use when dealing with engineering type problems. If there is not one available, maybe you could do an article on the language.

Also, are there any programs which can solve equations with large numbers of variables in them that use matrixes to solve them?

R J Denning
28 Lynton Road
Midsomer Norton
Bath
Avon

Dragon disk drive

I recently read a letter, which I believe was in your columns, concerning the Dragon Data Disk Drive and the use of variables to *Load* and *Run* a program direct from disk. Although *Load* will function using variables the *Run* command will not in the way mentioned in your correspondent's letter. There is an alternative method, however, by using the *Chain* command in an existing program. The lines used to write the *Chain* command in will be overwritten by the incoming program, as will any program line in memory, but a program in memory such as

"Unfortunately, comrade, the system won't be operational until we can get the Sinclair QL microchip"

```
10 INPUT A$
20 CHAIN A$
```

will work satisfactorily and so will the incoming program providing you use a Clear statement at the beginning of the Disk program to clear any variables such as A$.

If, however, your correspondent wishes to retain the program in memory as well as the incoming program then the *Merge* command will accomplish this, bearing in mind that the disk program has priority and will overwrite any duplicated program lines.

I sincerely hope my points are clearer than the handbook accompanying the Dragon Disk Drive — for a relative beginner to disk use such as myself I found it assumed previous knowledge, and that I could find nearly as much information on how to use a disk drive in a copy of the *Beano*. Had I not a thirst for further knowledge perhaps I would stick to reading the *Beano*!

Many thanks for an excellent magazine through which I have subscribed to from issue 1 in the days of my ZX81. Keep up the interesting weekly 'plop' behind my letter box!

Geoffrey Milnes
141-145 Church Street
Paddock
Huddersfield
West Yorkshire

Program saving

Your readers may be interested to learn of a useful tip for saving a program.

I run a statistical analysis program every month updating a set of sales figures. Last month I had a loading problem on my Spectrum, which is normally well-behaved. It seemed to save properly but consistently refused to verify. Changes of volume and treble settings and even the recorder were of no avail.

It suddenly occurred to me that there might be a slight flaw in the tape. I advanced a few feet — and it loaded and verified straight away!

A E Bettridge
3 Ingleby Way
Wallington
Surrey

Character enlarger

Firstly, I would like to say how much I enjoy your magazine and I would like to plead for more ZX Spectrum programs.

However, I am writing to say that Ian Beardsmore's reply to Yun Patel's *Peek and Poke* problem is far from correct. If one wishes the program to do its job, then it is necessary to make the following changes.

CHANGE 160 for g = 8 to 1 step -1
170 if f-int (f/2)*2 then let a$ (g) = " "
and ADD 175 if f-int (f/2)*2 = 1 then let e$ (g) = "■"

I have enclosed the proper listing for this program (listing one). Once I had corrected the program, I then made a few alterations so that the program would enlarge characters 33 to 127 (listing two).

I trust that Ian Beardsmore did not use a Spectrum to answer the problem otherwise he would not have made these mistakes. Happy enlarging.

Jonathan Marks (15)
Spinningdale
7 Neidpath Road East
Whitecraigs
Glasgow

It's all double Dutch

Will somebody somewhere please help me?

I purchased a Vic20 starter pack not long ago and I have now bought the Introduction to Basic, Part 2, plus the programmers reference guide, but I find that I do not understand most of the material in the manuals.

Will somebody tell me if I am being stupid or am I reading the wrong books?

P E Chipchase
Pinfold Road
Upwell
Wisbech
Cambs

```
Listing 1 - Large Letters
            (Corrected)
  1 REM Correct listing for
    LARGE LETTERS by J Marks
100 INPUT a$
110 LET b=CODE a$
120 LET c=15616+(b*8)-256
130 FOR d=c TO c+8
140 DIM e$(8)
150 LET f=PEEK d
160 FOR g=8 TO 1 STEP -1
170 IF f-INT (f/2)*2 THEN LET e$(g)=" "
175 IF f-INT (f/2)*2=1 THEN LET e$(g)="■"
180 LET f=INT (f/2)
190 NEXT g
200 PRINT e$
210 NEXT d
Listing 2 - Characters 33 - 127
100 REM Listing for Characters
                       33 - 127
110 FOR b=33 TO 127
120 LET c=15616+(b*8)-256
130 FOR d=c TO c+8
140 DIM e$(8)
150 LET f=PEEK d
160 FOR g=8 TO 1 STEP -1
170 IF f-INT (f/2)*2 THEN LET e$(g)=" "
175 IF f-INT (f/2)*2=1 THEN LET e$(g)="■"
180 LET f=INT (f/2)
190 NEXT g
200 PRINT e$
210 NEXT d
220 POKE 23692,-1
230 NEXT b
```


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Bi-Plane

A new game for the Dragon 32 by Andrew Thompson

Having struggled across the Atlantic — wave-hopping in a hurricane rain lashing against the screen of your open cockpit — it is time to put the kite down on the first available space of clear land

As you cross over the American coast the clouds magically clear and down below is revealed — horrors — as far as the eye can see the city of Boston

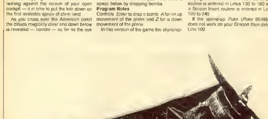
With nowhere to land you must clear a space below by dropping bombs

Program Notes

Controls *Enter* to drop a bomb *A* for an up movement of the plane and *Z* for a down movement of the plane

In this version of the game the skyscrapers scroll across the screen with the plane staying still The machine code Scroll Left routine is entered in Lines 130 to 180 and a Screen Invert routine is entered in Lines 190 to 240

If the speed-up *Poke* (*Poke* 65495,0) does not work on your Dragon then delete Line 100 ■



```
10 CLEAR200,29999
20 CLSRND(9)-1
30 PRINT@198,'WHAT LEVEL (1-10)?";
40 LINEINPUTL$
50 L=VAL(L$)
60 IFL<1THEN20
70 IFL>10THEN20
80 L=L+1
90 PLAY T255L255V31O1
100 POKE65495,0
110 CLS0
120 X=16
130 FORP=30000TO30028
140 READA$
150 A$= &H'+A$
160 POKEP,VAL(A$)
170 NEXT
180 DATA8E,04,00,A6,01,81,3E,27,0C,A7,80
,8C,05,FF,23,F3,86,BF,A7,1F,39,30,01,8C,
05,FF,23,ED,39
190 FORP=31000TO31036
200 READA$
210 A$="&H'+A$
220 POKEP,VAL(A$)
230 NEXT
240 DATA8E,04,00,A6,84,81,40,25,12,81,80
,25,04,81,C0,25,0A,80,40,A7,80,8C,05,FF,
23,E9 39,8B,40,A7,80,8C,05,FF,23,DF,39
250 FORP=0TO31
260 R=15-RND(L)
270 FORQ=15TOR STEP-1
280 POKE1024+P+Q*32,255
290 NEXT
300 NEXT
310 FORP=0TO31
320 POKE1535-P,191
330 NEXT
340 EXEC30000
350 IFPEEK(1025+X+Y*32)=255ORPEEK(1024+X
+Y*32)=255THEN430
360 IFPEEK(1025+X+Y*32)=131THEN560
370 POKE1024+X+Y*32,62
380 IFPEEK(339)=251GOSUB660 Y=Y-1 IFY<0T
HENY=0
390 IFPEEK(340)=223GOSUB660 Y=Y+1 IFY>15
THEN560
400 IFPEEK(338)=191ANDC=0THENA=X+1 B=Y C
=1 D=0
410 IFC GOSUB680
420 GOTO340
430 FORP=5TO255STEP10
440 EXEC31000
450 SOUNDP,1
460 NEXT
470 FORP=1TO100
480 EXEC30000
490 NEXT
500 PRINT@500,"YOU CRASHED',
510 FORP=1TO265
520 EXEC30000
530 NEXT
540 SOUND1,4
550 GOTO760
560 PLAY'T255L255V31O1CDEFGABO2CDEFGABO3
CDEFGABO4CDEFGABO5CDEFGAB
570 CLS4
580 PRINT@496,'YOU HAVE LANDED';
590 FORP=1TO200
600 EXEC30800
610 NEXT
620 CLS0
630 PRINT@40, YOU'VE LANDED",
640 EXEC31000
650 GOTO770
660 POKE1024+X+Y*32,128
670 RETURN
680 POKE1023+A+B*32,128
690 A=A-1
700 B=B+1
710 IFB>15THENC=0 RETURN
720 IFPEEK(1024+A+B*32)=131THENC=0 RETUR
N
730 IFPEEK(1024+A+B*32)=255THEND=D+1 IFR
ND(10-D)<=1THENL=0 RETURN
740 POKE1024+A+B*32,42
750 RETURN
760 CLSRND(9)-1
770 PRINT@99,'DO YOU WANT ANOTHER GO?";
780 A$=INKEY$
790 IFT=50THENT=0 EXEC31000
800 T=T+1
810 IFA$='Y'THENPRINT  YES'; SOUND255,3 
RUN
820 IFA$<>'N'THEN780
830 PRINT  NO';
840 SOUND1,1
850 END
```

```
30000    LDX 1024         8E0400
30003    LDA (X+1)        A601
30005    CMP A 62         813E
30007    BEQ +12          270C
30009    STA (X INC 1)    A780
30011    CMP X 1535       8C05FF
30014    BLS -13          23F3
30016    LDA 191          86BF
30018    STA (X+31)       A71F
30020    RTS              39
30021    LEA X (X+1)      3001
30023    CMP X 1535       8C05FF
30026    BLS -19          23ED
30028    RTS              39
```

```
31000    LDX 1024         8E0400
31003    LDA (X           A684
31005    CMP A 64         8140
31007    BLO +18          2512
31009    CMP A 128        8180
31011    BLO +4           2504
31013    CMP A 192        81C0
31015    BLO +10          250A
31017    SUB A 64         8040
31019    STA (X INC 1)    A780
31021    CMP X 1535       8C05FF
31024    BLS -23          23E9
31026    RTS              39
31027    ADD A 64         8B40
31029    STA (X INC 1)    A780
31031    CMP X 1535       8C05FF
31034    BLS -33          23DF
31036    RTS              39
```

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Echo Amplifier How would you like to listen to the sound output from your ZX Spectrum without ear strain? The Stonechip Echo amplifier can do this for you as well as easing the tedium of saving or loading of tapes and enlarging the range of tape recorder compatibility with the computer The amplifier has volume control over a range adequate for most uses and a tone control for harsh or mellow sounds A switched interface removes the need to swap leads during SAVEing or LOADing Leads are left connected all the time and the desired function is selected on the three position switch by the user Use of the CUE facility enables an audio cue to precede the program being SAVEd on tape a decided advantage when searching through a multi-program tape. The Echo simply plugs into the Ear, Mic and Power sockets of the computer and does not require an additional power supply The expansion port at the rear of the computer is left free for use with other peripherals and the unit is housed in an attractive case custom designed to complement the ZX Spectrum



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As clear as crystal

***Graham Taylor** talks to Crystal Computing about their range of individual software*

A little while ago things were nice and simple in computer software. There were adventure games — which involved fantasy worlds full of locked chests, secret caves, enigmatic clues and, above all, text — and then there were arcade games which always involved aliens and lasers or aliens and mazes.

Recently though the picture has got more and more blurred, with adventures getting moving graphics — previously unheard of — and arcade games being populated by magic potions, spells, warlocks and secret doors.

Call these games what you wish (please not arcventures) but whatever they are they're here to stay. The latest examples of this hybrid, Ultimate's *Atic Atac* and Imagine's *Alchemist* are supplanting both arcade and adventure games in the charts.

It's impossible to say exactly where the crossover began, but if we must pick one candidate it has to be Crystal Computing's *Halls of the Things* — a game that has as many admirers today as when it was first released around six months ago.

Although the oldest member of Crystal is only 22, they have been around for quite some while — since February 1982 in fact. Graham Stafford, Neil Mottersheed, Simon Brattel and Martin Horsley met when they were all on the same computer science course at the University of Manchester.

They discovered they had a mutual interest in designing and building their own computers. Crystal Computing's first release was a 1K games pack for the ZX81 — all the games were in machine code. This was followed by a monitor program for the ZX81 — as Crystal took up more and more time they left the university course.

Then came the Spectrum. "It really is a wonderful machine for playing games on, look at some of the amazing games that are being created now — but it isn't so easy to program on," says Simon, one of the programmers.

In fact, the team does not now program on the Spectrum at all. "At first we used a Nascom which really is an excellent machine in many ways but now we have built our own development computers," added Simon.

Using the Nascom, Crystal developed the Zeus Assembler for the Spectrum — now regarded as about the best available. "It was delivered to Sinclair (who are distributing it) a while back but it was only released a few months ago," explained Graham.

Zeus and the deal with Sinclair gave Crystal one big advantage: "power with the bank to market *Halls* in the way we knew it should be marketed."

Crystal were unaware that *Halls* would be the ground-breaking program it has turned out to be. "All we were interested in doing was making a game which we would, and still do, enjoy playing ourselves — I was not interested in adventures as such at all."

Halls was completed a while before its eventual release in late summer last year. "We deliberately held back the launch of *Halls* until we could do it properly." Crystal explain the game's success in conventional terms. "It's nothing to do with being this or that sort of game, *Halls* is a good game in the same way that *Monopoly* is a good game — because the basic idea is sound and we paid great attention to detail."

One of the few games Crystal really admire is *Manic Miner* — a game which reflects much of their own thinking. "First of all, it's a good addictive game but then there are all the touches, obvious things like the music and subtle things like the way you hardly ever get colour attribute problems when Willy passes other different coloured objects — in a way it's just as much an adventure as *Halls*.

"That's the kind of detail we've tried to concern ourselves with. In *Halls* you won't find too many objects changing colour as they pass one another because we spent a lot of time thinking about how to prevent those kinds of thing from happening," stressed Simon.

Recent months have seen more programs from Crystal, some of them more conventionally arcade in form like *Invasion of the Body Snatchers*, others like *Warlock of Firetop Mountain* directly related to *Halls*.

Warlock was one of the first of the increasingly popular 'Bookware' packages where a best-selling book has a program written especially for it and the two are packaged together. The *Warlock* program owes much to *Halls of the Things* — there is a man you must move through mazes collecting weapons and avoiding monsters.

"We ended up doing it quite by accident — we simply bumped into Steve Jackson, one of the authors of the book, in Currys one day — we got talking, he came back and looked at *Halls* and liked it."

The final program was completed in six weeks. "Puffin were fairly stringent in their requirements for the game. There were all sorts of things we had to put in — likewise there were things we couldn't do."

Both Simon and Graham were keen to stress that *Warlock* is not *Halls of the Things II*. It's definitely a separate project. The official follow up to *Halls* will be called *Return of the Things* and will be out later this year.

"It won't be soon, because it's the actual game that's important. People are too easily impressed by good graphics — it may look nice, but will you still be playing it weeks or months afterwards? That's the important question ... on the other hand you can hardly ignore the things that the likes of Ultimate are doing with sprites — people won't accept simple graphics anymore, so that's something we're very conscious of with *Return*."

Sometime last September, Crystal became profitable. Whilst welcome, this was not without its headaches. "We live and work together in a large house. The mail order cassettes are largely handled by our parents, but it's getting more and more difficult not to get bogged down in mundane things — there are always countless bits of paper to be looked at."

Doubtless adding more both to Crystal's bank balance, as well as to its mountain of paperwork, is the next release, almost certainly titled *It's the Wooluf!* "It's a sheep herding game that was sent in on spec, but don't be put off by the sound of it. The graphics are superb and it's very funny."

There is also talk of doing some programs for the Commodore 64, perhaps a version of *Halls* but there are some problems with that. "As everyone says, the graphics and sound capabilities of the 64 are excellent but in fact the processing power is abysmal — that's why you haven't yet seen too many fast 'everything happening at once' games."

With their tongues lodged firmly in their cheeks, Graham and Simon summed up Crystal's success. "I think it's down to our high score tables — we have the best high score tables in the business ... our high score tables are the only ones error trapped for things like swear words and are the only ones to talk back to you."

Graham and Simon would give little away, but suggested that anyone interested try typing 'Tony Bridge' in the *Invasion of the Body Snatchers* table and see what happens. "It's a sort of tribute for his review of *Halls*," they said smilingly. ■

The camels strike back

***David Lawrence** takes his revenge on this latest round-up of games for the Commodore 64*

Microcomputer software has finally come of age as a consumer product. Gone, it seems, are the days when the rumour that a game was breaking new ground was enough to send us all scurrying to buy scruffily labelled cassettes accompanied by photocopied instructions. The package is here.

Bright, alluring and totally irrelevant to the contents, the package will increasingly reign over our choices, or so the manufacturers believe from the amount of the stuff they are wrapping around cassettes.

The only problem is that, like breakfast cereal, the packet is often more nourishing than the contents. Three of the poorest games in this review came in the brightest and slickest packages!

In my last review of Commodore 64 software I predicted that the 64 market would spawn some shameful software, not



because of any fault in the machine, but precisely because its graphics and sound capabilities are so sophisticated that any idiot can write something that looks good at first sight. I'm sorry to say that time is proving me right. The message to owners of the 64 is: be careful. There is an increasing amount of nicely boxed, heavily advertised rubbish around, so do make use of the game reviews and the experience of friends before you buy.

When I first ran *Moon Buggy* from Anirog, I thought I was going to be extremely unimpressed. That was partly because the use of the 64's multicolour mode gave the graphics a slightly chunky and crude feel, and partly because I couldn't play it. With time, however, this unassuming game has grown on me and is the most popular of all the games in this review with my children.

The task is to control an All Terrain Moon Buggy (ATMB) as it races along the lunar surface. You can accelerate, decelerate and jump. You are threatened by helicopters, tanks, mines and craters and rocks. Craters and rocks must be jumped over, as must mines, and sometimes only acceleration can give you the necessary clearance. Tanks fire at you on sight and you must jump your buggy over the shot. All the while a helicopter drones overhead dropping bombs. Your armaments consist of an upward firing missile and forward firing gun. As I say, it's an unassuming game and yet one that you can play for a long time without losing interest.

There were a few graphics bugs in the version that I had — after one or two games, chunks of the title page began to disappear and the helicopter was no longer visible. The graphics are not the most creative on record but they nevertheless represent a consistent attempt to customise everything that appears on the screen.

Hexpert, again from Anirog, is a classic case of a good concept being ruined by lack of attention to detail. The game itself is one of those pyramid-leaping affairs.

Unfortunately such games rely on you being able to see where on the pyramid of blocks you have already been and in this version the contrast between the original colour of the blocks and the new colour when a block has been landed-on is almost indetectable. Bert, the sweet little furry creature who plays on your behalf, is indistinguishable from the background except as a broken white mass. Every software house should test its material against a wide range of tvs to ensure proper contrast between colours.

As if that wasn't bad enough, the controls to the game felt sluggish in the extreme, making play very difficult. Most joysticks are at their weakest when controlling diagonal movements because two switches have to be activated. One good idea used by some other software houses is to give players the option of turning the joystick through 45 degrees so that it still feels as if you are moving the stick diagonally, but you are in fact making use of right-angled movements of the joystick and, hence, only one switch at a time.

One last carp, I cannot bear games which do not pause to show you the score at the end.

When I first played *Attack of the Mutant Camels* to review it for *PCW*, I thought that it was one of the most immediately addictive, enjoyable and well-presented games that I had ever come across. Now the camels strike back in Llamasoft's latest release, *Revenge of the Mutant Camels*, as you control a mutant camel on its walk of destruction through successive zones representing scenes borrowed from many of today's popular games.



As the game progresses you are successively bombed by birds, rained on by cats and dogs, threatened by hordes of flying whacky walking sticks, attacked with miniature Llamas by someone called Manic Minter, savaged by *mutant* mutant camels and persecuted by mad Australian skiers no doubt related to Horace.

As ever, the game is packed with the attention to detail that makes Jeff Minter's games stand out from the pack. The graphics are superb and the range of scenery and detail a constant surprise. I am not so sure that *Revenge of the Mutant Camels* has all the tension of its older brother, but it is certainly a game you can get into straight away yet go on playing for a long time.

If you're sick of camels all together, how about a bit of peaceful mowing in another Llamasoft game — *Hovver Bovver*.

What could be more relaxing? Well, quite a few things, like Russian roulette, if your neighbourhood is anything like the one in Jeff Minter's 'non-violent' story of simple suburban folk trying to get the garden done.

Since your mower is out of action you set off to neighbours' houses to *borrow* theirs, unfortunately forgetting to ask. There follows a hectic chase through a series of gardens as you try frantically to finish the grass before Jim, Tom or Alf catch up with you and reclaim the mower. For company, apart from irate neighbours that is, you have your dog, but he's a mixed blessing since although you can use him to keep neighbours at bay for a time, he also tends to get in the way of the mower and overload it, stopping you dead. Oh, and mind the flower beds. If you run over them you could end up with a whole flock of angry gardeners chasing you.

It's nice to see Jeff Minter declare a truce, however temporary, with aliens everywhere and produce an amusing, innovative and graphically excellent game such as this one. Just about my only reservation is the continual rendition of *English Country Garden* that goes on in the background.

There was a time when I vowed that if

ever I saw another game with snakes bats or spiders chasing a little man around a maze with the little man desperately trying to pick up swords and torches to give himself power over the pursuers I would perform major brain surgery on my 64 How do I reconcile that with the fact that I'm now going to recommend a game in which snakes bats and spiders chase a little man around a maze ?

The answer is that what is wrong with so



many games on the market is not so much the fact that they copy from existing ideas it's simply that they copy without adding anything original *Krystals of Zong* from PSS is different

The basis for *Krystals* is a maze chase but this time in addition to seeking the power pills sorry *swords* the player is trying to build up a supply of treasures which are locked away in treasure rooms To get into the treasure rooms the keys must also be found And all the time the snakes bats spiders, etc

The game is played out on a 3×3 grid of nine rooms with eight different levels all accessed by ladders The graphics are stylised and neat the varied musical and sound effect backgrounds well chosen Though this is not an inspired game it is a thoroughly competent commercial effort

Long ago in the dim and distant past our family bought a prehistoric piece of electronics called the Atari Video Computer Along with it we lashed out and bought a cartridge called *Air Sea Battle* Hours of fun dropping depth charges at submarines and firing missiles at planes Now, such is progress that only seven years later you can go out and buy substantially the same game for the Commodore 64 — *Moby Dick* again from PSS

If you're tired of variety and imagination in your computer games then this is the one for you The only good thing about the game is the idea behind the name which has a whale frolicking along with the submarines If you hit the submarines fine, if you hit the whale then another ship darts out and rams you The author is also clearly prejudiced against submariners If you shoot down the helicopter that is attempting to bomb you you are then supposed to try and catch the pilot before he drowns No such mercy is shown to enemies underwater

The sound is almost entirely crude white noise explosions plus a kind of put-putting which I suppose is meant to represent the engine of your ship

This would be a game to be proud of if you had sat down and written it at home Commercial software houses really should be offering something better

Returning briefly to the Atari Video Computer on the free cartridge that came with it were some interesting little games involving planes fighting There were clouds to hide behind guided missiles all great fun and so archaic that it would make you laugh now

It would make most people laugh anyway Obviously not Terminal Software however, who have released a blockbuster of a program which has two fairly tawdry sprites (one of which wasn't properly defined on the version that I had and so could hardly be seen) crawling around the screen shooting at each other until one hits the other 10 times Ah you say, but what about the trimmings they're what makes the difference Unfortunately there aren't any

To be fair, some ingenuity has been lavished on the sequence which takes place when one of the players wins with the loser's plane spiralling down to a crash, followed by the pilot suspended from a parachute The effort would have been better expended on making the game remotely interesting

Hunter again from Terminal is not much better There's something a little upsetting about having to savage both new releases from a fresh software house

Even more upsetting is the fact that there are people who think that the way to start up a new software house is to produce boring games like *Super Dogfight* and this *Hunter* has a plane being pursued around a less than interesting maze by robot planes which get faster for each set of them you destroy The maze is no more than a regular grid of rectangles and appears not to change at all as the game progresses Nor do the pursuers

From the ridiculous to the sublime — *Pottit* from Romik There is nothing terribly clever about the idea behind the game It is simply a kind of two player billiards for the 64 What *is* terribly clever is the sheer precision of the program in simulating balls bouncing around on a billiard table The resemblance in terms of movement and bounce is quite uncanny even down to the 'click' as ball meets ball

There are four pockets for potting the red or your opponent's ball, there is even a little scoreboard at the bottom which not only records the score but advises you on your best shot

It seems unfair that such a nice program should get the shortest mention in the review just because it is simple So to redress the balance Full marks for good programming good taste and good fun

If you think that some of the other games reviewed here were bad just get a look at *Goodness Gracious* from Beyond Software The plot as described in the shiny brochure is that the dinosaurs have to protect their diamond, which is constantly under attack from a variety of creatures

To do this wait for it you press the space bar to shoot a fireball! The *only* control in the whole of the game is how long you hold the space bar down before releasing it thus determining how far the fireball will be shot before it starts to fall The score sheet consists of a single line of normal text across the top of the screen to tell you what your score was then another line

One day someone will explain to me how programs like this game can possibly co exist with some of the superb software being designed today ■

Firm	Program	Cost	Value (1-10)
Anirog Software	*Moon Buggy*	£7 95	6
8 High Street	*Hexpert*	£7 95	4
Horley			
Surrey			
Llamasoft	*Revenge of the*		
49 Mount Pleasant	*Mutant Camels*	£7 50	9
Tadley	*Hovver Bovver*	£7 50	9
England			
Personal Software Services	*Krystals of Zong*	£7 95	8
452 Stoney Stanton Road	*Moby Dick*	£7 95	4
Coventry CV6 5DG			
Terminal Software (UK)	*Super Dogfight*	£9 95	5
28 Church Lane	*Hunter*	£9.95	4
Prestwich			
Manchester M25 5AJ			
Romik Software	*Pottit*	£8 95	9
272 Argyll Avenue			
Slough			
Berks			
Beyond Software	*Goodness Gracious*	£6 95	4
Farndon Road			
Market Harborough			
Leicestershire LE16 9NR			



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Designer screen

***Keith and Steven Brain** present a Sprite Designer program that will allow you to plan your design on screen*

Although it is possible to plan a complicated design in your head or on paper it is a lot more convenient if you can actually try out different ideas directly on the screen This Sprite Designer program will allow you to manipulate any of the 255 characters on the screen to produce whatever design you might need and then save the design as an array

When the program is Run a series of prompt messages are printed to indicate the options available and then the entire screen is turned to dark grey (to aid visibility) A blue window is formed at the top left (in which the sprite is built up) and the entire character set is printed out (inverted) at the bottom of the screen

Bottom cursor

To start with a yellow flashing cursor is positioned over *CHR$(0)* (the pound sign) and this cursor can be moved to any other character by using the , , 'q and 'a keys Notice that when you move the cursor the number following the "bottom cursor" prompt is updated to the current character, so that you are always sure which character you are using

Picking up a character

When you press the space key the bottom cursor freezes on yellow over the current character The yellow character has now effectively been 'picked up' and is available for placing in the design area.

Top cursor

At the same time a black flashing cursor is turned on in the blue box This can be moved around the box with the same keys as the bottom cursor

Dropping a character

If you press the 'z' key then a copy of the character under the bottom cursor will be transferred to the top cursor position To make repeated copies of the same character at different positions keep moving and then press '

Deleting a character

If you wish to delete a character at a particular position simply place the top cursor over it and press 'x'

Returning for another character

To go back to the character set to collect another character, Press 'RTN' when the top cursor will go off and the bottom cursor will start flashing again

Wiping the box clean

If you decide that you need to start your design again then pressing '#' (shifted 3) when the top cursor is activated will delete all the current characters in the design area, and return you to the character selection mode

Changing the size of the box

The standard box is 10x10 but you can easily alter this (from 1 to 10 units) by pressing '!' (shifted 1) when a series of prompts will be displayed asking for start and end positions on both X and Y axes Note that the positions are numbered from 0 to 9 so that they correspond to the keys 0 to 9 This option can be used even after you have started your design as it is non-destructive

Saving your sprite

The '@' (shifted) key leads to a simple routine which transfers the characters on the screen to an array, prompts you to save this array updates the sprite number and goes back to the main routine This array is saved under the name specified by you and can be reloaded into a different program and used If you do not want to use arrays to hold your sprites then you can easily transfer the character numbers of the finished sprite to paper in the correct sequence by moving the top cursor around the box and recording the "current character" value at each point

Variables

Here are the functions of the main variables

CL	current column of top cursor
LI	current line of top cursor
SC	start column for box
LC	last column for box
SL	start line for box
LL	last line for box
BR	colour code for box
P	bottom cursor position (0 to 255)
PU	update for bottom cursor
HU	bottom cursor colour
CU	column update for top cursor
LU	line update for top cursor
CR	current character under bottom cursor
CC	current character under top cursor
OF	screen offset for character number display
MES	size change prompt messages

```
SPRITE DESIGNER

10 GOSUB 500
20 FOR CL=SC TO LC FOR LI=SL TO LL
30 POKE CO+(LI*40)+CL BR POKE CH+(
LI*40)+CL 32
40 NEXT LI CL LI=SL CL=SC
50 FOR N=0 TO 255 POKE CH+680+N N
NEXT N
60 IF PEEK(14351)<>6 THEN K=0 GOTO
90
70 K=PEEK(14346)
80 POKE CO+680+P 7*16+15
90 PU=(K=59)-(K=58)+40*((K=113)-(
K=97))
100 IF P+PU>-1 AND P+PU<256 THEN P
=P+PU
110 POKE CO+680+P HU
120 IF K=32 THEN 140
130 GOSUB 330 GOTO 60
140 IF PEEK(14351)<>6 THEN K=0 GOT
O 160
150 K=PEEK(14346)
160 C2=CO+(LI*40)+CL
170 POKE C2,6
180 IF K=35 THEN 330
190 IF K=64 THEN 430
200 CU=(K=59)-(K=58):LU=(K=113)-(K
=97)
210 IF CL+CU>=SC AND CL+CU<=LC THE
N CL=CL+CU
220 IF LI+LU>=SL AND LI+LU<=LL THE
N LI=LI+LU
230 POKE C2=6*16
240 IF K=122 THEN POKE C2 CP
250 IF K=120 THEN POKE C2 32
260 IF K=13 THEN POKE C2 F GOTO 60
270 IF K=35 THEN 20
280 GOSUB 290 GOTO 140
290 ME$="INPUT X START" GOSUB 360
GOSUB 370 SC=VAL(KE$)
300 ME$="INPUT X END " GOSUB 360
```

```
GOSUB 370 LC=VAL(KE$)
310 ME$="INPUT Y START" GOSUB 360
GOSUB 370 SL=VAL(KE$)
320 ME$="INPUT Y END  " GOSUB 360
GOSUB 370 LL=VAL(KE$)
330 ME$="                " GOSUB 360
SC=SC+1 LC=LC+1 SL=SL+1 LL=LL+1
340 FOR CL=1 TO 10 FOR LI=1 TO 10
POKE CO+(LI*40)+CL 15*16+15 NEXT LI
 CL
350 CL=SC LI=SL GOTO 140
360 FOR M=1 TO 13 POKE CH+480+ME,A
SC(MID$(ME$,ME 1)) NEXT ME RETURN
370 KE$=INKEY$ IF KE$=""THEN 370
380 RETURN
390 CP=PEEK(CH+690+P) CP$=RIGHT$("
  "+STR$(CP) 3)
400 CC=PEEK(CH+(LI*40)+CL) CC$=RIG
HT$("  "+STR$(CC) 2)
410 FOR N=1 TO 3 POKE CH+OF+N ASC(
MID$(CP$ N 1))
420 POKE CH+OF+N-40 ASC(MID$(CC$,N
-1)) NEXT N RETURN
430 FOR CL=SC TO LC FOR LI=SL TO L
L A(CL LI)=PEEK(CH+(LI*40)+CL)
440 NEXT LI CL PRINT CHR$(11) CSAV
E*A SP=SP+1 GOTO 510
500 DIM A(10 10) CH=12328 CO=13352
510 PRINT CHR$(11) SC=1 SL=1 LC=10
 LL=10 OF=190 HU=3 SR=6
520 FOR N=0 TO 959 POKE CO+N 7*16+
15 NEXT N
530 PRINT TAB(14)"SPRITE NO" SP
540 PRINT TAB(52)"TOP CURSOR"
550 PRINT TAB(14)"BOTTOM CURSOR"
560 PRINT TAB(14)"TOP CURSOR"
570 PRINT TAB(14)"'SPACE' TO COLLE
CT CHR$"
580 PRINT TAB(14)"'z' TO DROP CHR$
"
590 PRINT TAB(14)"'/' TO DELETE CH
R$"
600 PRINT TAB(14)"'RTN' FOR NEXT C
HR$"
610 PRINT TAB(14)"'P' TO SAVE SPRI
TE"
620 PRINT TAB(14)"'#' TO WIPE"
630 PRINT TAB(14)"'!' TO CHANGE SI
ZE"
640 POKE CH+431 32 RETURN
```


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PCW

Memory jogger

***Barry Lowry** presents a help utility subroutine for any program where there is an extensive list of commands*

This subroutine was originally written as an amendment to J. Coote's Turtle graphics program (*PCW* 28 July-3 August). It is designed to allow the user to reference a database of the various option commands available, together with a brief description of their function as a 'Memory Jog' by simply typing *Help* when the computer prompts for an option command.

This is very useful in the Turtle graphics program, where one can forget exactly what option does what and what the particular syntax of the parameters are. This routine would also be of use in any program where there is an extensive list of commands and remembering each command's function can be difficult.

The subroutine uses the bottom two lines of the Spectrum's screen normally used for the report messages. This means that the normal screen working area (Lines 0-21) is unaffected by the routine, so help is available at all times and asking for help will not destroy any picture already being displayed.

Although specifically written for the Turtle graphics program, it should be easily adaptable for use in other Spectrum programs, and a close study of the routine's logic should enable people with other machines to implement it.

Variables

H	Loop control variable
V$	Holds the option command being queried
P$	General string holding variable
B$	General string holding variable
data	Holds the line number of the first Primary data statement
endata	Holds the line number of the last Primary data statement

Lines 3000-3007	Menu display and selection
Lines 3010-3085	Option Command List routine
Lines 3110-3175	Option Command Query routine
Lines 3700-3710	Clear HELP SCREEN routine
Lines 3800-3815	Primary Data Statements
Lines 3900-3914	Secondary data statements

IN Line 5004 GOSUB 9001: GOTO 100 refer to a subroutine and line in the Turtle Graphics program and should be deleted if the routine is not being used in this context.

Primary Data Statements are the Option Commands. Secondary Data Statements are the Option function descriptions.

To use this subroutine with J. Coote's Turtle graphic program simply type in the subroutine listing and *Merge* it with the Turtle graphics program. Once *Merged* add the following line:

320 IF i$="hel" THEN GOTO 3000

If you now run the program and type *Help* when you are asked for a Command, the Help Menu should be displayed on the bottom two lines.

One important thing to note when using the Help Utility is that once the Option Command Query Mode has answered your query by displaying the option command you queried plus its function description, it will wait for you to press a key before returning you to the help menu.

For people with machines other than the Spectrum who might wish to adapt the routine, there are two Spectrum idiosyncracies which might confuse the issue.

(i) The #0 and #1 in the print statements are the Spectrum's way of allowing the user to write to the restricted part of the screen, the bottom two lines.

(ii) The Spectrum's string handling is different from other common home computers. So V$ (TO 3) should be replaced with LEFT$ (V$,3). ■

```
HELP LISTING DATE>17 09 83

3000 REM HELP UTILITY PROGRAM
      © B.J.  LOWRY 1983
3001 PRINT #0,AT 0,0; BRIGHT 1;"
option List/option Query/eXit"
3002 PRINT #1,AT 1,0; BRIGHT 1;"
PRESS L/Q/X for help required"
3003 IF INKEY$="" THEN GO TO 300
3
3004 IF INKEY$="L" OR INKEY$="l"
 THEN GO SUB 3700: GO TO 3010
3005 IF INKEY$="Q" OR INKEY$="q"
 THEN GO SUB 3700: GO TO 3110
3006 IF INKEY$="X" OR INKEY$="x"
 THEN GO SUB 3700: GO SUB 9900:
GO TO 100
3007 GO TO 3001
3008 REM OPTION COMMAND LIST
3009 REM ********************
3010 PRINT #0,AT 0,0; INK 1; PAP
ER 5;"Help LISTMODE>"
3015 PRINT #1,AT 1,0; INK 1; PAP
ER 5;"E=End,S=Scroll"



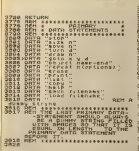
3020>LET data=3800: LET endata=3
815
3025 RESTORE data: READ p$,b$
3030 FOR H=1 TO (endata-data)
3035 PRINT #0,AT 0,15;p$
3040 PRINT #1,AT 1,15;b$
3045 PAUSE 0
3050 IF INKEY$="S" OR INKEY$="s"
 THEN GO TO 3065
3055 IF INKEY$="E" OR INKEY$="e"
 THEN GO TO 3001
3060 GO TO 3045
3065 LET p$=b$: READ b$
3070 NEXT H
3075 GO SUB 3700
3080 PRINT #1,AT 1,0;"--End of C
ommand Word List--"
3085 PAUSE 40: GO SUB 3700: GO T
O 3001
3090 REM OPTION COMMAND QUERY
3100 REM ********************
3101 REM ********************



3110 LET data=3800: LET endata=3
815
3115 INPUT AT 0,0;"What Option c
ommand do you need  HELP with?;"
,v$
3120 IF LEN v$<3 THEN PRINT #0;A
T 0,0;"Under 3 letters please RE
-TYPE": BEEP .3,-25: PAUSE 50: G
O TO 3115
3125 PRINT #1,AT 1,0; FLASH 1; B
RIGHT 1;"--SEARCHING--"
3130 LET v$=v$( TO 3)
3135 RESTORE data: READ p$: LET
p$=p$( TO 3)
3140 IF v$=p$ THEN GO TO 3155
3145 IF data=endata THEN PRINT #
1;AT 1,0; FLASH 1; PAPER 2; INK
7;" -NO SUCH OPTION COMMAND- ":
PAUSE 76: GO TO 3001
3150 LET data=data+1: GO TO 3135
3155 RESTORE data: READ p$: REST
ORE data+100: READ b$
3160>PRINT #0,AT 0,0;"OPTION QUE
RY>",p$
3165 PRINT #1,AT 1,0;b$
3170 PAUSE 0
3175 GO SUB 3700: GO TO 3001
3180
3690 REM CLEAR 'Help-Screen'
3695 REM ********************
3700 PRINT #0,AT 0,0;"

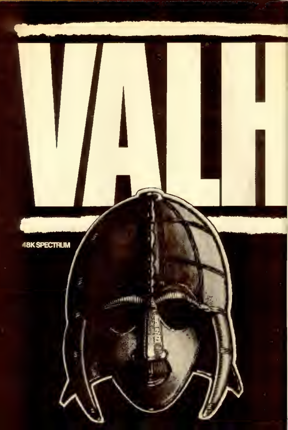
3710 PRINT #1,AT 1,0;"
```

Continued on page 23



```
3720 RETURN
3770 REM ***********************
3775 REM *        PRIMARY        *
3780 REM * DATA STATEMENTS       *
3790 REM ***********************
3800 DATA "stop"
3801 DATA "size n"
3802 DATA "move n"
3803 DATA "turn d"
3804 DATA "draw n"
3805>DATA "goto x y d"
3806 DATA "object name-end"
3807 DATA "repeat n(options)"
3808 DATA "erase"
3809 DATA "print"
3810 DATA "list "
3811 DATA "copy "
3812 DATA "help "
3813 DATA "save filename"
3814 DATA "load filename"
3815 DATA "                    "     REM A
 dummy string
3816 REM ************************
3817 REM THE LAST PRIMARY DATA-
      -STATEMENT SHOULD ALWAYS
       BE A DUMMY STRING FILLED
      WITH SPACES SO THAT IT IS
      EQUAL IN LENGTH  TO THE
     PRIMARY DATA STATEMENT
     BEFORE IT.
3818 REM ************************
3820
```

```
3925>
3870 REM ***********************
3880 REM *    SECONDARY         *
3885 REM *  DATA STATEMENTS     *
3890 REM ***********************
3900 DATA "TERMINATES PROGRAM EX
ECUTION"
3901 DATA "INCREASES SIZE VARIAB
LE BY n"
3902 DATA "MOVES n PIXELS LEAVIN
G NO LINE"
3903 DATA "CHANGES DIRECTION BY
d DEGREES"
3904 DATA "DRAWS LINE n PIXELS L
ONG"
3905 DATA "GOTO x,y & POINT d DE
G TO HORIZN"
3906 DATA "STORE OPTION COMMANDS
 UNDER name"
3907 DATA "REPEAT OPTIONS WITHIN
 () n TIMES"
3908 DATA "CLEARS SCREEN"
3909>DATA "PRINT DEFINED OBJECTS
 TO PRINTER"
3910 DATA "LISTS DEFINED OBJECTS
 TO SCREEN"
3911 DATA "COPIES SCREEN DISPLAY
 TO PRINTER"
3912 DATA "OPTION Query & List S
ystem"
3913 DATA "SAVES DEFINED OBJECTS
 ON TAPE"
3914 DATA "LOADS DEFINED OBJECTs
 FROM TAPE"
3920 REM ***********************
3925 REM *   END OF ROUTINE     *
3930 REM ***********************
```


VALH
48K SPECTRUM

Time waits for no man

Paul Barnard presents a program for those who need reminding of the passing time

This is a useful routine for all programmers who forget the time whilst playing with their favourite toy. It provides a constant reminder of the passing hours.

The program makes use of the *IRQ* interrupt which is continually being generated by the computer. A series of nested counts are generated, these being:

1 — The frame count
2 — The second count (&H7F06)
3 — The minute count (&H7F04)
4 — The hour count (&H7F03)

The frame count is decremented every time there is an *IRQ* interrupt; every time it reaches zero the second count is incremented. A check is performed on the second count to see if it has reached 60; if it has, then the minute count is incremented. This process is repeated to check for the passing of hours and also a 24-hour period.

The display routine uses a look-up table to convert the time counts into ASCII codes ready for display and the clock will display the time in the top right-hand corner of the display.

The routine is transparent to the user who can continue using the computer for whatever task is needed. The only commands that effect the time-keeping of the routine are cassette operations, as the interrupt is disabled during *CSave* and *CLoad*.

To set the routine going you must change the *IRQ JMP* in Ram to the start of the clock routine. This is done using

POKE 269,&H7F:POKE 270,&H06

The display can be disabled by

POKE &H7F02,0

The display is re-enabled by

POKE &H7F02,1

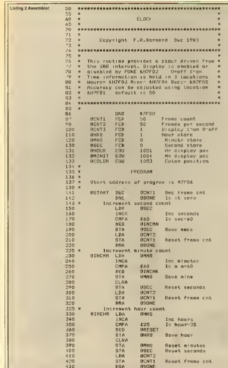
Set the time by *Poke*ing the hour, minute and second counts with the correct values.

If the clock does not keep good time it can be adjusted by *Poke &H7F01,nn*. The default value of 50 seems to be reasonably accurate and only small changes should be required; increase to slow down.

Note: Listing 1 is a Basic loader routine. Load this and Run, New the program and there you are. The listings were produced from programs proved to be working, therefore they should be accurate. ■

Listing 1 Basic Loader

```
1 DATA 50,50,1,12,00,00,122,127,0,38,86,182,127,5,76,129
2 DATA 60,39,11,183,127,5,182,127,1,183,127,0,32,67,182,127
3 DATA 4,76,129,60,39,15,183,127,4,79,183,127,5,182,127,1
4 DATA 183,127,0,32,44,182,127,3,76,129,25,39,18,183,127,3
5 DATA 79,183,127,4,183,127,5,182,127,1,183,127,0,32,18,134
6 DATA 1,183,127,3,79,183,127,4,183,127,5,182,127,1,183,127
7 DATA 0,182,127,2,129,0,39,29,142,127,136,182,127,3,72,236
8 DATA 134,253,4,27,142,127,136,182,127,4,72,236,134,253,4,30
9 DATA 134,58,183,4,29,126,157,61,48,48,48,49,48,50,48,51
10 DATA 48,52,48,53,48,54,48,55,48,56,48,57,49,48,49,49
11 DATA 49,50,49,51,49,52,49,53,49,54,49,55,49,56,49,57
12 DATA 50,48,50,49,50,50,50,51,50,52,50,53,50,54,50,55
13 DATA 50,56,50,57,51,48,51,49,51,50,51,51,51,52,51,53
14 DATA 51,54,51,55,51,56,51,57,52,48,52,49,52,50,52,51
15 DATA 52,52,52,53,52,54,52,55,52,56,52,57,53,48,53,49
16 DATA 53,50,53,51,53,52,53,53,53,54,53,55,53,56,53,57
18 CLEAR 200,&H7F00
19 DIM CS(16)
20 'COPYRIGHT P.R.BARNARD DEC 83
21 CS(1)=1005:CS(2)=1453:CS(3)=1341:CS(4)=1298
22 CS(5)=1512:CS(6)=1642:CS(7)=1533:CS(8)=1865
23 CS(9)=1142:CS(10)=810:CS(11)=820:CS(12)=812
24 CS(13)=822:CS(14)=832:CS(15)=842:CS(16)=852
25 N=0
30 FOR X=&H7F00 TO &H7FFF STEP 16
35 N=N+1
40 C=X:D=X+15
50 GOSUB 2000
60 IF B<>CS(N) THEN PRINT"DATA ERROR IN LINE";N:E=1
70 NEXT X
80 IF E=1 THEN STOP
90 INPUT "HOUR";H
100 INPUT "MINUTE";M
110 POKE &H7F03,H:POKE &H7F04,M
120 POKE 269,&H7F:POKE 270,&H06
130 STOP
2000 B=0
2005 FOR I=C TO D
2010 READ A
2020 POKE I,A
2030 B=B+A
2040 NEXT I
2050 RETURN
```



Listing 2 Assembler

```
50  *************************************************
55  *                                               *
60  *                     CLOCK                     *
65  *                                               *
70  *************************************************
71  *                                               *
72  *      Copyright  F.R.Bernard  Dec 1983         *
73  *                                               *
74  *************************************************
75  *                                               *
76  *  This routine provides a clock driven from    *
77  *  the IRQ interupt. Display is enabled or      *
78  *  disabled by POKE &H7F02     0=off 1=on       *
79  *  Time information is held in 3 locations      *
80  *  Hours= &H7F03 Mins= &H7F04 Secs= &H7F05      *
81  *  Accuracy can be adjusted using location      *
82  *  &H7F01   default is 50                       *
83  *                                               *
84  *************************************************
85  *
86               ORG      $7F00
87     @CNT1     FCB      50      Frame count
90     @CNT2     FCB      50      Frames per second
100    @CNT3     FCB      1       Display 1=on 0=off
110    @HRS      FCB      1       Hour store
120    @MNS      FCB      0        Minute store
130    @SEC      FCB      0        Second store
131    @HOUR     EQU      1051     Hr display pos
132    @MINIT    EQU      1054     Mn display pos
133    @COLON    EQU      1053     Colon position
134 *
135 *                  PROGRAM
136 *
137 *   Start address of program is $7F06
138 *
141    @START    DEC      @CNT1    Dec frame cnt
142              BNE      @DONE    Is it zero
143 *        Increment second count
150              LDA      @SEC
160              INCA              Inc seconds
170              CMPA     £60      Is sec=60
180              BEQ      @INCMN
190              STA      @SEC     Save secs
200              LDA      @CNT2
210              STA      @CNT1    Reset frame cnt
220              BRA      @DONE
225 *        Increment minute count
230    @INCMN    LDA      @MNS
240              INCA              Inc minutes
250              CMPA     £60      Is m n=60
260              BEQ      @INCHR
270              STA      @MNS     Save mins
280              CLRA
290              STA      @SEC     Reset seconds
300              LDA      @CNT2
310              STA      @CNT1    Reset frame cnt
320              BRA      @DONE
325 *        Increment hour count
330    @INCHR    LDA      @HRS
340              INCA              Inc hours
350              CMPA     £25      Is hour=25
360              BEQ      @RESET
370              STA      @HRS     Save hour
380              CLRA
390              STA      @MNS     Reset minutes
400              STA      @SEC     Reset seconds
410              LDA      @CNT2
420              STA      @CNT1    Reset frame cnt
430              BRA      @DONE
435 *        Restart clock after 25 hrs
440    @RESET    LDA      £1
```

```
450            STA    @HRS     Reset hours
455            CLRA
460            STA    @MNS     Reset mins
470            STA    @SEC     Reset secs
480            LDA    @CNT2
490            STA    @CNT1    Reset frme cnt
495 *      Check if dislay enabled
496    @DONE   LDA    @CNT3
497            CMPA   £0
498            BEQ    @ENDIT
499 *      Display time on text screen
500            LDX    £@LOOKUP Point to lookup
510            LDA    @HRS     Get hour
515            LSLA            Multiply by 2
520            LDD    A,X      Get characters
530            STD    @HOUR    Display hour
540            LDX    £@LOOKUP
550            LDA    @MNS     Get minute
555            LSLA            x2
560            LDD    A,X      Get chr
570            STD    @MINIT   Display
580            LDA    £$3A     Colon
590            STA    @COLON   Display colon
600    @ENDIT  JMP    $9D3D    Jump to IRQ rtn
605 *      Look up table for display characters
620    @LOOKUP FCC    "00010203040506070809"
630            FCC    "10111213141516171819"
640            FCC    "20212223242526272829"
650            FCC    "30313233343536373839"
660            FCC    "40414243444546474849"
670            FCC    "50515253545556575859"
675 *      End assembly
680            END
```

Odds on favourite

David Hesketh presents Horse Racing – *a game to test your skill at the races*

This program, as the name suggests, is a betting game. You are given £500 which you gamble away on one of the six horses. The program continues until you run out of money, and then a choice is given to play again.

The game is designed for the model B but it could be rewritten for a model A. The main part of the program is held between lines 100 and 720, with the procedures below 720. The odds are chosen in *ProcHorseList* but these do not affect the running of the horses.

The movement of the horses is random and is decided at the start of line 330. Therefore there is no actual skill involved in the choice of horse, but is gives an impression of this.

The game could be played at a party with everyone putting into a kitty that is paid to the winner. ■

```
L.
  5 REM HORSE RACING
 10 DIM H%(6)
 20 MODE 7
 30 VDU 23;8202;0;0;0;
 40 PROCTUNE(1,4)
 50 E=500
 60 PROCINSTRUCTIONS
 70 MODE 2
 80 VDU 23;8202;0;0;0;
 90 VDU 23,226,&08,&18,&28,&79,&3E,&3
    C,&4A,&99
100 '&FE00=&10200A
110 COLOUR 3
120 INPUT'BET ',B
130 IF B>E OR B<=0 THEN COLOUR 1:PRI
    NT"IMPOSSIBLE '''':GOTO 110
140 COLOUR 3
150 PROCHorseList
160 INPUT"HORSE (1-6) ',H
170 IF H>6 OR H<1 THEN COLOUR 1:PRIN
    T'IMPOSSIBLE '''":COLOUR3:GOTO
    160
180 COLOUR128:CLS
190 odd%=H%(H)
200 PRINT"BET '";B;' HORSE-";H
210 PRINT"AT ';odd%:'-1'
220 PROCSCREEN
230 sound%=1
240 FOR I=1 TO 6
250 PRINTTAB(19,I+4);1
260 HEXT 1
270 FOR I=1 TO 6
280 COLOUR 7
290 COLOUR 131
300 PRINTTAB(0,I+4);'|'
310 NEXT I
320 W=17:X=17:Y=17:Z=17:U=17:V=17
330 R=RND(6):sound%=sound%+1
340 IF R=1 THEN W=W-1
350 IF R=2 THEN X=X-1
360 IF R=3 THEN Y=Y-1
370 IF R=4 THEN Z=Z-1
380 IF R=5 THEN U=U-1
390 IF R=6 THEN V=V-1
400 COLOUR 1
410 PRINTTAB(W,5);CHR$(226);SPC(1)
420 COLOUR 7
430 PRINTTAB(X,6);CHR$(226);SFC(1)
440 COLOUR 0
450 PRINTTAB(Y,7);CHR$(226);SPC(1)
460 COLOUR 4
470 PRINTTAB(Z,8);CHP$(226);SPC(1)
480 COLOUR 5
490 PRINTTAB(U,9);CHR$(226);SPC(1)
500 COLOUR 6
510 PRINTTAB(V,10);CHR$(226);SPC(1)
520 IF X=1 OR W=1 OR Y=1 OR Z=1 OR U
    =1 OR V=1 THEN 560
530 FOR I=1 TO 200:NEXT I
540 SOUND 1,-10,sound%,1
550 GOTO 330
560 IF W=1 AND H=1 THEN 680
570 IF X=1 AND H=2 THEN 680
580 IF Y=1 AND H=3 THEN 680
590 IF Z=1 AND H=4 THEN 680
600 IF U=1 AND H=5 THEN 680
610 IF V=1 AND H=6 THEN 680
620 E=E-B
630 COLOUR130
640 COLOUR9:PRINTTAB(0,13)"YOU'VE LO
    ST '''"
650 COLOUR4:PRINTTAB(0,15);'MONEY LE
    FT=';E
660 IF E<=0 THEN FOR I=1 TO 2000:NEX
    T I:MODE 7:'&FE00=&10200A;PROCTU
    NE(2,3):PROCPOEM:GOTO 20
670 GOTO 110
680 E=E+B+(B*odd%)
690 PROCTUNE(2,4)
700 COLOUR 130
710 COLOUR9:PRINTTAB(0,13)"YOU'VE WO
    N '''"
720 GOTO 650
730 DEFPROCTUNE(P,F)
740 ENVELOPE 1,3,0,0,0.1.1,1,126.-4,
    0,-4,126,80
750 D%=5:Q%=0:R%=0
760 FOR N%=0 TO 60 STEP F
770 P%=12+(N%+(N%MOD12=8))MOD16
780 SOUND 1,1,P%*4,D%
790 SOUND P,1,Q%*4,D%
800 SOUND 3,1,R%*4.D%
810 R%=Q%:Q%=P%
820 NEXT
830 ENDPROC
840 DEFPROCINSTRUCTIONS
850 C$=CHR$(141)+CHR$(130)
860 T$='HORSE RACING'
870 PRINTC$,T$:PRINTC$.T$
880 PRINT'TAB(7)'for BBC Micro Model
    B"
890 PRINTTAB(8)"by David Hesketh on"
900 PRINTTAB(12)"12.2.1983"
910 PRINT''You are at Newbury to bet
    on the'
920 PRINT''SCHWEPPES GOLD TROPHY HAN
    DICAP HURDLE'"
```

```
930 PRINT"race at 2.40 pm."
940 PRINT"     There are 6 runners
    and all odds"
950 PRINT"are calculated by the comp
    uter.You"
960 PRINT"start off with 500 pounds
    and this is"
970 PRINT"all the money you have to
    bet with"
980 C$=CHR$(141)+CHR$(129)
990 T$="G O O D  L U C K "
1000 PRINT'C$,T$:PRINTC$,T$
1010 PRINTTAB(0,20);"Any key to cont
     inue"
1020 D$=GET$
1030 ENDPROC
1040 DEFPROCPOEM
1050 C$=CHR$(141)+CHR$(129)
1060 T$="HARD LUCK !!"
1070 PRINTC$,T$:PRINTC$,T$
1080 PRINT''"YOU'VE LOST ALL YOUR MO
     NEY"
1090 PRINT''"YOU DON'T KNOW WHERE TO
     GO"
1100 PRINT''"YOU CAN'T AFFORD THE TRA
     IN FARE HOME"
1110 PRINT''HO ! HO ! HO !"
1120 PRINT'''"Another game ?"
1130 A$=GET$
1140 IF A$="N" THEN CLS:END
1150 IF A$="Y" THEN 1170
1160 GOTO 1130
1170 ENDPROC
1180 DEFPROCSCREEN
1190 GCOL 0,2
1200 MOVE0,0:MOVE1279,0
1210 PLOT 85,0,650
1220 PLOT 85,1279,650
1230 GCOL 0,3
1240 PLOT 85,0,880
1250 PLOT 85,1279,880
1260 GCOL 0,2
1270 PLOT 85,0,950
1280 PLOT 85,1279,950
1290 ENDPROC
1300 DEFPROCHorseList
1310 PRINT:PRINT"HORSE    ODDS":PRINT
1320 COLOUR 4
1330 FOR c%=1 TO 6
1340 H%(c%)=RND(7)+2
1350 NEXT c%
1360 FOR c%=1 TO 6
1370 PRINT"Horse ";c%;"  ";H%(c%);"-1"
1380 NEXT c%
1390 PRINT
1400 COLOUR 3
1410 ENDPROC
```



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GSH

Spritely movements

***Milosc Versipellis** presents a program for moving sprites with a joystick*

This program allows you to use a joystick to move a sprite around the screen. The program ends when you press the fire key on the joystick. It is intended for people who want to experiment with various shapes, speeds, colours and conditions of sprite with a view to writing games programs.

The program has a command line, or main program, running from 0 to 100, a middle subroutine as a two-liner at 20,000, a short move and read joystick routine at 21K and a long and elaborate beginning at 30K.

The beginning sets up the move vectors for the sprites, so that a number 10 coming from the joystick points to the 10th *x y* pair of the array, ie *+1 +1* which moves the sprite down and right one step. When you pull the joystick down and right, it sends a number 10 to port 2. With the vectors "mapped" to the joystick, the sprite obeys the joystick since every move the joystick makes points to the correct and matching numbers in the array.

The next array to be set up stores the bit numbers needed to do various jobs. This is followed by two more pieces of sprite housekeeping — twitching the sprite to life and giving it a home of its own. Your sprite now has a local habitation and a name but no shape.

The shape lies at line number 40,000+ and is laid out very carefully in 3-byte chunks, each of which stands for a line of dots on the sprite itself.

```
40017 DATA  3byte line 0  3byte line 1  3byte line 2
40022 DATA  3byte line 3  3byte line 4  3byte line 5
40030 DATA  3byte line 6  3byte line 7
40070 DATA                              3byte line 20
```

The data is laid out in hex code because with a little practice you can visualise the arrangement of dots. It is easier drawing the sprite on hexadecimal graph paper than any other way since the sprite can be typed in directly.

It is best at the start to model sprites in solid without any fine touches until you get the hang of it, so here are some solid lines in hex.

LEFT	*MIDDLE*	*RIGHT*
81	FF	80
83	FF	C0
87	FF	E0
0F	FF	F0

That is a stubby triangle. To hollow out the middle, try

81
C3
E7
FF

Each hex number digit corresponds to four dots on the screen

```
0000   is Hex 0
0001   is Hex 1
0011   is Hex 3 = 1+2
0111   is Hex 7 = 1+2+4
1111   is Hex F = 1+2+4+8
```

starting from the other end

```
1000   is Hex 8
1100   is Hex C = 8+4
1110   is Hex E = 8+4+2
1111   is Hex F = 8+4+2+1
```

After the graphic data is *Poked* into place, the experimenter can choose whether or not to enlarge his sprite. There then follows a series of variables to lay out the screen limits, the speed in various directions, the starting position and direction and the sprite activated.

I have tried, as far as possible, to give each variable an explicit name. It is possible in Commodore Basic to give a name like *Spritebase* when defining the variable and then to use only *Sp* in the program since the Basic only looks at the first two characters.

The experimenter can insert his own *Gosubs* in the middle, so long as they come before the over flag is checked. The fire key is again a place where a *Gosub* could be placed. The readings and settings for port 1 are identical to port 2.

Lastly, the move and fire routine is mainly concerned with handling the case where the screen *x* horizontal count goes over 256. Happy experimenting! ■

```
0
1 REM************* SPRITEGAMEBASE ******
2
3 REM          BY MILOSC VERSIPELLIS
4
5 REM              JANUARY 1984
6
7 REM          FOR THE  COMMODORE 64
8
9 REM**************************************
10 GOSUB 30000 REM BEGIN
20 GOSUB 20000 REM MIDDLE
30 END
90
20000
20001 REM*******MIDDLE*********************
20007
20100 GOSUB21000
20900 IF NOT OVER THEN GOTO 20000
20990 RETURN
21000
21001 REM READJOY AND MOVE SPRITE
21007
21100 JOY = NOT PEEK(PRT2)
21110 DIR = JOY AND DMASK
21120 FX  = JOY AND FIMASK
21130 IF FX THEN OVER=-1
21200 X1  = X + VECTR(DIR,0) * XSPEED
21210 Y1  = Y + VECTR(DIR,1) * YSPEED
21300 IF X1 < XLO OR X1 > XMAX OR Y1 < YLO OR Y1 >
      YMAX THEN GOTO  21990
21310 X   = X1
21320 Y   = Y1
21400 A   = INT(X/256)
21401
21410 IF A THEN 21700 REM HANDLE MSB
21411
21420 POKE SP + 2 * SN , X
21430 POKE SP + 2 * SN + 1,Y
21440 POKE SP + 16,0
21441
21450 GOTO 21990    REM EXIT
21451
21700 REM HANDLE MSB OF SPRITE REGISTER
21701
21710 POKE SP + 8 , X-256
21720 POKE SP + 16 ,SPRITE 4)
21730 POKE SP + 9 , Y
21731
21990 RETURN
30000
30001 REM*******BEGIN**************
30007
30050 PRINT "[CLR]PLEASE WAIT"
30093
30100 REM SET UP [illegible]
30101
30110 DIM [illegible]
30111
30120 [illegible]
30130 [illegible]
30140 [illegible] READ VECTRS [illegible]
30150 NEXT
30160 NEXT
30161
30170 DATA 00,00 [illegible]
30180 DATA 00,00, [illegible]
30190 DATA [illegible] 00,00 [illegible]
30200 DATA [illegible]
30299
30300 REM [illegible]
30301
30310 [illegible]
30320 [illegible]
30330 [illegible]
30331
30340 [illegible]
30341
```

```
38360 [illegible]
38362 READ SPRITE [illegible]
38370 NEXT
3837[illegible]
38380 [illegible] 231 [illegible] 224 [illegible]
385[illegible]
3850[illegible]
38[illegible]
38[illegible]
38[illegible]
38[illegible]
38540 [illegible]
38550 NEXT
385[illegible]
38560 [illegible]
38570 READ DT$
38580 [illegible]
38582 POKE [illegible]
38590 NEXT
385[illegible]
38600 REM [illegible]
38[illegible]
38[illegible]
38[illegible]
38630 REM [illegible]
38640 REM POKE SPRITEBASE [illegible]
386[illegible]
38650 POKE SPRITEBASE [illegible]
38660 POKE SPRITEBASE [illegible]
38700 POKE [illegible] THE [illegible]
38[illegible]
38720 [illegible]
38730 [illegible]
38740 [illegible]
38750 [illegible]=120
38760 [illegible]=150
38770 [illegible]
38780 [illegible]=322
38790 [illegible]
38[illegible]
38810 [illegible]=20
38820 [illegible]=30
388[illegible] [illegible]=15
38840 XSPEED=8
38850 YSPEED=8
38[illegible]
38[illegible]
38[illegible]
3[illegible]
3[illegible] REM [illegible]
3[illegible]
3[illegible]
3[illegible]
3[illegible]
312[illegible]
312[illegible]
312[illegible]
3[illegible]
3[illegible]
3[illegible]
3[illegible]
3[illegible]
319[illegible]
42000 REM****** SPRITE DATA *****
4200[illegible]
42010 DATA [illegible]
42020 DATA [illegible]
42030 DATA [illegible]
42040 DATA [illegible]
42050 DATA [illegible]
42060 DATA [illegible]
42070 DATA [illegible]
4208[illegible]
4209[illegible] REM[illegible]
422[illegible]
```

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Screen

on Dragon 32

Many people will have noticed with envy the fancy title pages which some machine code programs display whilst loading. It is not possible to copy this effect with *Basic* programs. However, it is possible to fool the computer into thinking that it is loading a machine code program, and only tell it afterwards that it has loaded a *Basic* program.

The *Basic* program is saved as if it were machine code, and the *Basic* pointers at 25 and 27 are also saved. The technique is really quite simple. For a demonstration, type in listing 1 and *Run* it. When you hear the *Sound* 100 1 set the recorder to record and then press any key. Once the program has been saved enter *Pcls New* and rewind the tape. Enter *Cloadm Cloadm Run* for a demonstration. There you have just loaded a *Basic* program with a title page displayed instead of a blank green screen. Enter *Pcls New* and *10 Screen1, 0 Cloadm Cloadm* and then after rewinding the tape again *Run*. This time the program loads displaying the graphics. Loading will finish with a *Syntax Error* in 10 but this can be ignored and the program *Run* as normal.

To use this technique in your own programs just follow the steps below.

(1) write and run a program to draw a fancy title page, and save it to tape. The last line should be 999 *Csavem* 1023 1535 359 for a text title, or 999 *Csavem*, 1534 7680 359 for a graphics title

(2) *Poke*25 6 *New* to achieve a PCLEAR0 if there are no graphics to save

(3) *Cload Basic* program or type it in

(4) Enter 'A = PEEK(27) * 256 + PEEK(28) PRINT A' (make a note of this value)

(5) Rewind tape to start of saved title screen

(6) Enter *Cloadm Sound*100 3 Exec41194 *Csavem* , 25 28 34213 *Csavem* 1023 A 34213 (insert the value you recorded for A)

(7) On *Sound*100 3 set recorder to record and then press any key

(8) Once saved rewind and enter *Cloadm Cloadm Run* to test

```
10 PMODE4,1:PCLS:SCREEN1,0
20 FOR A=10 TO 125 STEP5
30 CIRCLE(125,35),A,1,.3
40 NEXT A
50 FOR A=3 TO 40 STEP1.5
60 CIRCLE(125,95),A,1,3
70 NEXT
80 CLS0:PRINT@75,"TEST PROGRAM";:PRINT@168,"BY PETER WHITTAKER";
   :PRINT@256,"";
90 FOR A=128 TO 255:PRINTCHR$(A);:NEXT
100 A$=INKEY$
110 SOUND100,1
120 IF INKEY$=""THEN120
130 CSAVEM"",25,20,34213:CSAVEM"",1023,PEEK(27)*256+PEEK(28),34213
```

Screen
by Peter Whittaker

Millipede

on Spectrum

This is a short but addictive game for the 16K machine. The player must guide a millipede down a constantly scrolling screen. So far, so good, the difficult part is making your millipede eat the 0 seeds and avoid the X mines. The former is vital to keep your "mill" moving whilst the mines are of course deadly.

Z Left
X Right
0 Hold

Program notes

10-80	Sets all the variables. The *Poke* in line 40 puts the computer into upper case. Line 30 calls the instruction and graphics routine
100-250	This is the main loop. It prints the millipede, checks if anything has been run over, prints an increasing number of mines, prints the seeds and moves the millipede. Line 170 scrolls the screen up one character
270-370	Explosion routine
380-450	Play again? routine
470-530	No more energy routine
540-660	Instructions and User Defined Graphics. The millipede shape is found by pressing Graphics shifted M

```
15 REM   Bill Morris   1983
30 GO SUB 540
40 CLS : POKE 23658,8
50 LET pts=0
60 LET x=31
70 LET c=15
80 LET c=-10
90 REM ********MAIN LOOP********
100 PRINT AT 10,x; INK 7;"■"
110 IF CODE (SCREEN$ (11,x))=88
THEN GO TO 260
120 IF CODE (SCREEN$ (11,x))=79
THEN BEEP .009,30: LET pts=pts+
5: PRINT AT 11,x;"■"
130 PRINT AT 21,INT (RND*32),"O"

140 FOR f=0 TO c STEP 15
150 PRINT AT 21,INT (RND*32); I
NK 2;"X"
160 NEXT f
170 LET a=USR 3280
180 BEEP .007,1
190 IF INKEY$="Z" THEN PRINT AT
0,x;" ": LET x=x-1
200 IF INKEY$="X" THEN PRINT AT
0,x;" ": LET x=x+1
205 IF INKEY$="0" THEN PAUSE 0:
PAUSE 0
210 IF x<0 THEN LET x=0
220 IF x>31 THEN LET x=31
230 LET c=c+.2
240 IF c>pts THEN GO TO 460
250 GO TO 90
260 REM ******BLOW UP******
270 LET x1=(x*8)+4
280 PLOT x1,x2
290 FOR x=0 TO 3
300 FOR f=0 TO 7
310 PLOT x1-f*3,x2-f*3
320 PLOT x1+f*3,x2+f*3
330 PLOT x1-f*3,x2+f*3
340 PLOT x1+f*3,x2-f*3
```

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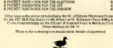
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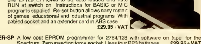
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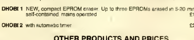
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```
350 BORDER f  BEEP .01,f*3
360 NEXT f
370 NEXT x
380 BORDER 2
390 PRINT AT 8,10, INK 5, FLASH
 1, POINTS ",pts
400 PRINT AT 10,10, INK 5, FLAS
H 1,"AGAIN ? Y/N",  "
410 PAUSE 0
420 BORDER 0
430 IF INKEY$="Y" THEN GO TO 40
440 IF INKEY$="N" THEN STOP
450 GO TO 410
460 REM ▚▚▚▚▚NO ENERGY▚▚▚▚▚
470 LET b=.1
480 IF b>3 THEN GO TO 520
490 BEEP b,-b
500 LET b=b*2
510 GO TO 480
520 PRINT AT 6,10, INK 5, FLASH
 1,"NO MORE ENERGY"
530 GO TO 390
540 REM ▚▚▚▚INSTRUCTIONS▚▚▚▚▚
550 FOR f=0 TO 7
560 READ z  POKE USR "*"+f,z
570 NEXT f
580 DATA 255,60,255,60,255,60,2
55,60
590 BORDER 0  PAPER 0  INK 4  B
RIGHT 1
595 CLS
600 PRINT AT 2,3,"BILL BYTE SOF
TWARE Presents"
620 PRINT AT 5,10, INK 2  FLASH
 1," MILLIPEDE
630 PRINT AT 8,6, INK 5,"INSTRU
CTIONS -"
631 PRINT AT 10,8,"▪ Left"
632 PRINT AT 12,8,"▪ Right"
633 PRINT AT 14,8,"▪ Hold"
640 PRINT AT 16,3, INK 5,"5 Poi
nts for every O eaten"
641 PRINT AT 17,3, INK 5,"Avoid
the deadly X mines"
650 PRINT AT 21,5, INK 6, FLASH
 1,"PRESS ANY KEY TO PLAY"
660 PAUSE 0  RETURN
```

Millipede
by Bill Morris

Moonflight

on Vic20

You have to shoot down the Aliens before they land on earth which is represented by a continuous line. The Aliens can only get through to earth where there is a gap in the line. After every two phases you have to dock your ship (land your arrow on top of the other arrow). You have three lives but can get EXTRA lives and points when you pass 10 000 and 30 000.

N = LEFT
M = RIGHT
F = FIRE

Program notes

8-9	Initialise variables
110-230	Draw screen
300-437	Move targets and check if you lose a life
550-570	Move your ship
700-110	Fire and check if you go on to a new phase
1000-1070	Lose a life
1500-1560	Scoring
2000-2120	Docking

Variables

T =	Targets
SC =	Score
PH =	Phase
NL =	Check if you have passed 10 000 and 30 000
TG =	Number of aliens screen display code
CL =	Colour
LV =	Your ship

PROGRAM OF THE WEEK

```
1 REM *************
2 REM * MOONFLIGHT *
3 REM *     BY     *
4 REM *   JULIAN   *
5 REM *  FRANKLYN  *
6 REM * (C)23/7/83 *
7 REM *************
8 DIMT(8)
9 SC=0:PH=1:LIVES=3:C=30720:NL=0
10 POKE36879,30
11 PRINT"":PRINT"▪▪▪▪▪            ▪"
20 PRINT"▪▪▪▪ MOONFLIGHT ▪"
30 PRINT"▪▪▪▪            ▪"
40 PRINT:PRINT"HIT ANY KEY"
50 GETA$:IFA$=""THEN50
100 REM * SCREEN *
110 POKE36879,8:PRINT"SCORE="SC
120 ONPHGOTO130,150,170,190
130 REM * PHASE 1 *
140 TG=81:CL=7:T=5:T(1)=7862:T(2)=7873
    :T(3)=7889:T(4)=7908:T(5)=7914:LV=
    8153:GOTO220
150 REM * PHASE 2 *
160 TG=127:CL=2:T=5:T(1)=7062:T(2)=787
    3:T(3)=7889:T(4)=7908:T(5)=7914
165 LV=8153:GOTO220
170 REM * PHASE 3 *
180 TG=42:CL=5:T=6:T(1)=7862:T(2)=7873:
    T(3)=7889:T(4)=7908:T(5)=7914:T(6)=
    7955
185 LV=8153:GOTO220
190 REM * PHASE 4 *
200 TG=160:CL=6:T=4:T(1)=7790:T(2)=7792
    :T(3)=7809:T(4)=7811:LV=8153
220 PRINT"▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪
    "
230 FORJ=1TOT:POKET(J),TG:POKEC+T(J),CL
    :NEXTJ:POKELV,30:POKELV+C,1
300 REM* MOVE TARGET *
310 FORJ=1TOT
320 IFPEEK(T(J)+1)=30THEN436
330 IFPEEK(T(J)+22)=30THEN436
340 IFPEEK(T(J)-1)=30THEN436
350 IFPEEK(T(J)-22)=30THEN436
360 M=INT(1+6*RND(0))
370 IFM=1ANDPEEK(T(J)-22)=32THENM=-22:G
    OTO420
380 IFM=2ORM=5ORM=6THEN410
390 IFM=3ANDPEEK(T(J)-1)=32THENM=-1:GOT
    O420
400 IFM=4ANDPEEK(T(J)+1)=32THENM=1:GOTO
    420
405 GOTO360
410 IFPEEK(T(J)+22)=32THENM=22
420 POKET(J),32
430 T(J)=T(J)+M:POKET(J),TG:POKET(J)+C,
    CL:IFT(J)>8097THEN436
431 NEXTJ
435 GOTO550
436 GOSUB1000
437 GOTO120
550 REM * MOVE *
560 FORV=1TO2
570 GETM$:IFM$=""THEN570
580 IFM$="F"THEN700
590 IFM$="N"THEN620
600 IFM$="M"THEN660
610 NEXTV
620 IFLV=8142THEN650
640 POKELV,32:LV=LV-1:POKELV,30:POKELV+
    C,1:GOTO300
650 NEXTV:GOTO300
```

```
660 IFLV=8163THEN650
680 POKELV,32:LV=LV+1:POKELV,30:POKELV+
    C,1:GOTO300
700 REM * FIRE *
701 POKE36878,15:POKE36875,189:FORN=1TO
    10:NEXTN
702 POKE36875,0:POKE36878,0
710 FORF=22TO448STEP22
720 IFPEEK(LV-(F+22))=TGTHEN740
730 POKELV-(F-22),32:POKELV-F,35:NEXTF:
    POKELV-(F-22),32:NEXTV:GOTO300
740 POKELV-(F+22),32:POKELV-(F-22),32
750 GOSUB1500
756 T=T-1
760 IFT=0THEN780
770 NEXTV:GOTO300
780 FORJ=1TO8:POKET(J),32:NEXTJ
781 IFPH=1THENPH=2:GOTO120
790 IFPH=3THENPH=4:GOTO120
800 IFPH=2ORPH=4THENGOSUB2000
900 IFPH=2THENPH=3:GOTO120
910 PH=1:GOTO120
1000 REM * LIVES *
1010 LIVES=LIVES-1
1020 POKE36877,201
1025 POKE36878,15:FORN=1TO1500:NEXT
1030 FORMS=15TO0STEP-1
1040 POKE36878,MS:FORN=1TO500:NEXTN
1050 NEXTMS:POKE36877,0
1060 IFLIVES=0THEN1080
1065 POKELV,32:FORJ=1TO8:POKET(J),32:NE
     XTJ
1070 RETURN
1080 PRINT"JSCORE="SC:END
1500 REM * SCORING *
1501 POKE36874,120
1502 FORMS=15TO0STEP-1
1503 POKE36878,MS:FORN=1TO20:NEXTN,MS
1504 POKE36874,0
1510 IFPH=1THENSC=SC+10:GOTO1550
1520 IFPH=2THENSC=SC+30:GOTO1550
1530 IFPH=3THENSC=SC+30:GOTO1550
1540 IFPH=4THENSC=SC+50
1550 PRINT"■SCORE="SC:IFNL=3THENRETURN
1555 IFNL=2THEN1580
1560 IFSC>=10000THENLIVES=LIVES+1:SC=SC
     +500:NL=2
1570 RETURN
1580 IFSC>=30000THENLIVES=LIVES+1:SC=SC
     +1000:NL=3
1590 RETURN
2000 REM * DOCKING *
2010 PRINT"J":LV=LV-(18*22):POKELV,30
2020 POKE8153,30
2030 FOROK=1TO20
2040 GETDK$:IFDK$=""THEN2040
2045 POKELV,32
2050 IFDK$="M"THENLV=LV+1+22
2060 IFDK$="N"THENLV=LV-1+22
2070 POKELV,30
2080 IFPEEK(LV+22)=30THENPRINT"■■■■■W
     ELL DONE!":SC=SC+2000:GOTO2110
2090 IFLV=8153THENGOSUB1000:POKE8153,32
     :RETURN
2100 NEXTOK:PRINT"J":RETURN
2110 POKE36878,15:FORL=1TO100:POKE36876
     ,INT(RND(1)*128)+128:FORM=1TO10
2120 NEXTM,L:POKE36876,0:POKE36878,0:PR
     INT"J":GOTO1550
```

Moonflight
by Julian Franklyn

Frogger

on ZX81

The object of this game is to get your frog home as many times as possible. You cannot move left, right or down — only UP! You move up by using the '1' key.

10-50 Sets the variables
60-140 Prints all the screen
190-216 Moves your frog to a new position
220-230 Checks if you have hit an obstacle
240 Checks if you are home
270 Prints new position after frog is home
280-290 End of game
300-303 Procedure for score and new position

```
5 REM "FROGGER BY G.WILSON"
10 LET A=4
15 LET B=5
16 LET X=2
20 LET Y=3
30 LET F=5
40 LET E=1
50 LET S=0
60 PRINT"(2*iSP:iFROGGER:2*iSP)"
70 PRINT"(5*iSP:SP:5*iSP)"
80 FOR U=1 TO 4
90 PRINT "(iSP:9*SP:iSP)"
100 NEXT U
110 PRINT AT 1,0,"(12*iSP)"
120 PRINT AT 2,E,"(SP:iSP)"
130 PRINT AT 3,F,"(iSP:SP)"
140 PRINT AT A,B,"H"
150 IF E=9 THEN LET E=1
160 IF F=0 THEN LET F=8
170 LET E=E+1
180 LET F=F-1
190 LET X$=INKEY$
200 IF INKEY$="1" THEN LET A=A-1
215 PRINT AT A,B,"H"
216 PRINT AT A+1,B," "
220 IF A=Y AND A=F THEN GOTO 280
230 IF A=X AND A=E THEN GOTO 280
240 IF A=1 AND A=5 THEN GOSUB 300
270 GOTO 110
280 CLS
290 PRINT S," FROGS HOME"
299 STOP
300 LET S=S+1
301 LET A=4
302 LET B=5
303 RETURN
```

Frogger
by Gary Wilson



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Dice

on BBC

This simulation of two dice is rather straightforward but fast and short. The basic shapes are defined in line 20 (A$ = □ B$ = ⬭). The D-loop of line 40 alternately draws the two possible shapes of the two dice (the I-loop of line 60) with the delay of the F-loop of line 60. After the D-loop the □-shape of the two dice is drawn and the proper number of spots is selected through the RND-function.

During the loop I have each time erased the previous shapes of the dice by clearing the screen, but in a program where the high resolution screen is in use and not empty, a rather more elegant blanking out can be obtained by replacing the *Pcls* 5 in lines 60 and 80 by *Line* (22, 22)-(106, 49) *Preset Bf*. Also, if you want to distinguish the two dice you can *Paint* (90, 30), 0, 0 after drawing D$(I + 2) in line 60 and after drawing D$(3) in line 80. You would also have to replace the *Psets* of lines 110, 210, 310, 410, 510 and 610 with *Presets* (eg, 110 *Preset* (84, 34): *Return*). However, this slows down the whole process so that the F-loop has to be shortened.

```
5 'DICE/RUDY DUYCK/1983
10 PMODE0,1:PCLS5:SCREEN1,1:COLOR0,5
20 D$(1)="BM24,24;XA$;":A$="R20D20L20U20":D$(2)="BM34,24;XB$;":B$="F12G
   12H12E12":D$(3)="BM74,24;XA$;":D$(4)="BM84,24;XB$;"
40 FORD=1 TO10
50 FORI=1 TO2
60 PCLS5:DRAWD$(I):DRAWD$(I+2):FORF=1 TO15:NEXTF
70 NEXTI,D:R1=RND(6):R2=RND(6)
80 PCLS5:DRAWD$(1):DRAWD$(3)
90 ONR1 GOSUB100,200,300,400,500,600
93 ONR2 GOSUB110,210,310,410,510,610
95 IFINKEY$=""THEN95ELSEGOTO10
100 PSET(34,34,0):RETURN
110 PSET(84,34,0):RETURN
200 PSET(34,32,0):PSET(34,38,0):RETURN
210 PSET(84,32,0):PSET(84,38,0):RETURN
300 PSET(30,30,0):PSET(34,34,0):PSET(38,38,0):RETURN
310 PSET(80,30,0):PSET(84,34,0):PSET(88,38,0):RETURN
400 PSET(32,32,0):PSET(36,32,0):PSET(32,36,0):PSET(36,36,0):RETURN
410 PSET(82,32,0):PSET(86,32,0):PSET(82,36,0):PSET(86,36,0):RETURN
500 PSET(32,30,0):PSET(36,30,0):PSET(34,34,0):PSET(32,38,0):PSET(36,38,0)
    :RETURN
510 PSET(82,30,0):PSET(86,30,0):PSET(84,34,0):PSET(82,38,0):PSET(86,38,0)
    :RETURN
600 PSET(32,30,0):PSET(36,30,0):PSET(32,34,0):PSET(36,34,0):PSET(32,38,0)
    :PSET(36,38,0):RETURN
610 PSET(82,30,0):PSET(86,30,0):PSET(82,34,0):PSET(86,34,0):
    PSET(82,38,0):PSET(86,38,0):RETURN
```

Dice
by Rudy Duyck

Orange

on Spectrum

On a colour television red and green mix to produce yellow green and blue mix to produce cyan red and blue mix to produce magenta red green and blue mix to produce white

By interrupting the Spectrum processor every 20ms (50 times a second) the primary and secondary colours can be re-mixed to produce tertiary colours

To do this an artificial attributes file must be set up at addresses 63000 63766 Address 63000 represents the same attribute square on the screen as address 22528 If address 63000 contains the value 49 then the square in the top left-hand corner of the screen will have its attribute set to the mixture of any of the primary or secondary colours These can be mixed in the bright state to tone them up for the best The machine code produces an orange on any mapped part of the screen, and is made up of a mixture of primary bright red and secondary yellow

Use Let a — *Usr* 32330 to switch the extra colour on, Let a — *Usr* 32340 to switch it off

```
  1 REM
  2 REM ORANGE by SIMON COX
  3 REM
 10 CLEAR 32329
 15 FOR n=32330 TO 32455  READ
a  POKE n a  NEXT n
 20 DATA 62,40 237,71,237,94,20
1,0 0.0.62.62,237,86,237,71,201,
0
 30 DATA 255,243,197,213,229,24
5,1 254 127,227,120,254,252,40,9
,205 144,128,241,225,209,193,251
,201 62.56,50,141 92 205,107 13,
1 254 127,237,120,254,252,40,247
,251 207,20.0.0 0,0 0,0,0,0
 35 DATA 229,197,245 213
 36 DATA 33,0,88
 37 DATA 17,24,246
 38 DATA 14,3,6,0,26,254,49.40,
6,254,50,40,9,24,12,62,58,18,54,
56,24,5,62,49,18,54,6,30,19,4,12
0,254,255,32,225,13,121,254,0,32
,217
 39 DATA 209,241,193,225
100 DATA 201
110 INK 0  PAPER 0  BORDER 0  C
LS
130 PRINT AT 20,0, [redacted]
131 PRINT AT 21,0 [redacted]
140 FOR n=63640 TO 63705  POKE
n.49  NEXT n
150 FOR n=63000 TO 63096  POKE
n 49  NEXT n
160 PRINT AT 0,2,"ORANGE by Sim
on Cox © 1983",AT 1,2,"An extra
colour for games and",AT 2,5,"Gr
aphical displays"
170 LET l=USR 32330
180 GO TO 180
```

Orange
by Simon Cox

Microradio

GW6JJN

Awards Manager

Many radio amateurs and short wave listeners liven up their life by trying to achieve awards Within amateur radio there are many awards to go for In fact I recently entered for the year of the Welsh Castles Award in which I spent many long hours in a ruined castle on top of a Welsh mountain trying to contact as many other activated castles as possible

The program that led to this train of thought is *Awards Manager* written by P Newman it can be obtained for the reasonable sum of £4 00 from 3 Red House Lane, Leiston Suffolk IP16 4JZ

The program is designed primarily for the VHF operator although I suspect it would be useful to the HF operator as well Once loaded it has an efficient window display where various types of information are updated

It will check and store call sign and ORA data for RSGB awards and can work on two awards at the same time It will give an alphanumerically sorted list and update of countries and squares worked at any point and will print them on to the printer if required for a hard copy record

When an award is attained the operator will be advised of this happy moment but the program will continue beyond this point for those in search of places in the Guinness Book of *Records* There is always an on screen summary of results and it will very quickly check whether or not you have worked a certain country or square when you hear a station calling on your receiver

It will not only tell you those areas you haven t worked but will do so on two levels It will tell you the ones that are theoretically possible as well as those that you can reasonably hope to get A very nice touch All data input can be listed at any time

Written for the 48K Spectrum, this is an elegant and well-structured program where a lot of effort has gone into being user friendly and impossible to crash There are other nice touches such as the friendly K in morse when the program has loaded Good use of screen space has produced a pleasing and informative display Data can of course both be saved to tape and verified

The program is supported by well written clear instructions and the author points out that over 200 hours work went into the program to make it useful and trouble free

If you have any software of interest to the radio enthusiast please let me know That goes for hardware too of course Microradio is constantly looking for new ideas in the world of radio computing

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike If you have any queries that you want answered hints and tips to share or topics that you would like to see covered write to Ray Berry Microradio *Popular Computing Weekly* 12 13 Little Newport Street, London WC2R 3LD



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A gentle start

At the recent Computer Fair at Wembley organised by *Your Computer* I took the opportunity of visiting several of the stands. Many of the software houses were showing new adventures, or talking of their plans for future releases.

CRL (which stands for Computer Rentals Ltd and whose boss, Clement Chambers, has been hogging the press just lately as the latest example of a computer entrepreneur) has a couple of new ones. *Woods of Winter*, written by Andrew Patrick and Andy Ward is a text adventure supported by graphics.

The player's position is shown by a flashing graphic representation of the location, with the route taken so far painted in red. By pressing *Symbol Shift* and *T*, a detailed text description of the location may be seen, with "obvious exits" and, if required, a large-scale drawing. All the usual text responses are recognised by the computer, such as *Take Axe, Help, Inventory* as well as *N S E* and *W*. Longer commands like *Pull the sword from the stone* also may be tried.

The other program, modestly entitled *The Incredible Adventure* is not really an adventure. The player moves around a playing area picking up various things like precious stones. A status panel to the side of the play area keeps the player informed of his strength, treasure and so on. The game is very pretty, with not one but two redefined character sets.

The sleeve has the usual blurb, this time about some weird objects called the Globes, one of which you have to find, by killing the evil Lord of Nadish. To accomplish this, you must somehow find the soul of the beasts which then ... well I can't figure it out, bit it might be worth trying if you are in the *D&D* sort of combat and treasure accumulating.

M C Lothlorien have gained an enviable reputation for their *Warmaster* series. Now they have launched a new series, this time called *Adventuremaster* (they also seem to have done quite well with the first of their *Arcademaster* programs). The first of the adventure line is *The Stolen Lamp*, initially for the BBC. The trend now is to release versions of the same program for several popular micros, so we can expect to see this text adventure for other machines soon.

Lothlorien are also in the final stages of a new program, this one being more of a strategy game. In this the player is the leader of a platoon, planning an assault on the enemy's headquarters. To accomplish this, he must pick a team which he thinks will be of help in completing the task set for him. More of this at a later date.

Richard Shepherd, between naps under the counter, was showing off his new adventure, *Urban Upstart*. This is a traditional text-with-graphics game, but set in a post 1984 big brother scenario. The old favourites, *Transylvanian Tower* and *Everest Ascent*, still seem to be selling as well as the new graphic adventures *Invincible Island* and *Devils of the Deep*.

Level 9 were showing their new adventure, *Lords of Time*. This program, written by newcomer Sue Gazzard, joins my favourite series, and is an extremely good addition to Level 9's consistently good catalogue (see the corner of a couple of weeks ago for a review of *Snowball*, which is the first of Level 9's *Silicon Dream Adventures*).

Lords of Time is a text adventure, as are all Level 9's games, and concerns an absurd dream you have. It turns out that the Evil Timelords are meddling with Earth's history and, of course, it is your job to defeat them. To accomplish this, you must travel through nine sectors of time and collect all the objects needed to defeat the Timelords. So, in one game, you will go from Prehistoric Ice Age, through Roman and Medieval times to the present and beyond to the far future! The inhabitants of the various sectors are not above creeping through to wreak havoc in another area.

As we have come to expect from Level 9, the program is executed with wonderful style — none of those boring "You can't do that" messages! Highly recommended.

One of my favourite devices is the *Gentle Start*. In many adventures, the player is told "You are in a forest clearing. You can see a sword". Then he is off on what amounts to a search for treasure and points.

The original mainframe adventure starts by a small building, inside which are the ubiquitous key, food and water. Once these are acquired, the player, if he is unlucky, then proceeds to get lost in the surrounding forest. If his luck holds, he will eventually come across a grate in a depression (can anyone tell me what the 2-inch slit in the river bed is for?). This grate is locked, but that proves no obstacle. Now the player finds himself in a low crawl or corridor in which he might find a bird and a wicker case. Then eventually, the famous snake!

So the player goes from the commonplace, and finally comes to a land of fantasy in which the game is played out.

Level 9's programs all start like this. *Colossal Adventure* is, except for an extra 70 locations in the endgame, based on the Crowther and Woods original. The start is similar, but adds one or two locations to make a rather more interesting *gentle start*. The last program in the Middle Earth series — *Dungeon Adventure*, has some 25 locations at the start — the set of puzzles is extensive, and a good start to the adventure which follows.

Snowball is not so complex in its beginning — the player awakes in a rejuvenation centre on board the huge spaceship, and has to tackle a sequence of coloured buttons, among other things, before the game proper starts. Sue Gazzard's *Lords of Time* begins "in your lounge, where you are de-bugging your latest program". In the next room is a grandfather clock, into which the player must climb in order to gain admission to the nine Timesectors in which the adventure takes place. The right sequence of words must be found in order for the door to open, and it can be frustrating trying to find that sequence.

One of the drawbacks of this job is that there are always new programs to look at, while the old favourites gather dust.

One of those that I find myself returning to again and again is *The Knight's Quest*, from Phipps Associates. I remember when this adventure first arrived in the office, we all stood around trying to solve the puzzle of the giant at the river. Once this was finally cracked (and the answer is maddeningly logical!), we then came across the next puzzle — that of the narrow cleft. This is one of adventure's great cliches, up there with The Maze (*Knight's Quest* even has one of these, disguised as Wastelands), The Snake, The Impenetrable Forest, and The Winding Passages. As with the Goblin's Dungeon, these are horrifying difficult to solve when met for the first time, after which, they can be sailed through.

This is one of the better examples of the *Gentle Start* — giving plenty of tough puzzles in a fairly simple setting, disguising from the player the fact that beyond there is a vast, more fantastic world to be explored. If you have not yet seen this wonderful adventure, I can recommend it.

Next week I shall be able to bring the *Hobbit Hall of Fame* up to date with many more names — for now, let me tell you that we have our first *Hero of Valhalla!* Graham Furniss of Derbyshire writes: "I successfully completed the adventure on 22 November 1983 at 1.30 in the morning. I would like to take this opportunity to congratulate Legend on producing a first-class adventure which I thoroughly enjoyed playing and will attempt to complete again!" ■

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.



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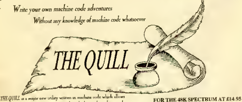
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TITLE PAGE

Paul C Robertson of Oakwood Road, Birmingham, writes

Q **I have drawn the title page for a game I am writing, and I would like to keep this on the screen while the rest of the program is *Loading*. How can I do this without it being partly overwritten by the other program when it is *Loading*?**

A The messages that appear on the screen during *Loading*, can in fact be moved by shifting the *Print* position. For this you need to have a screen display program auto run with the necessary *Print* statement in it. Chapter 20 of the manual goes into this whole question of auto-*Running* and screen displays. All that needs to be done is that two programs need to be *Saved* one after the other, the first containing the *Load* instructions for the second. To show what I mean, first enter this program

```
10 REM demo
20 PRINT AT 8,8 "DEMO
30 PRINT AT 10,8 "(Do not stop tape)"
40 PRINT AT 0,0
50 FOR a = 1 TO 704
60 PRINT "graphic 6"
70 NEXT a
80 PRINT AT 10,2 "HERE COMES THE MAIN PROGRAM
90 PRINT AT 20,0
100 LOAD "prog"
```

Line 40 re-sets the *Print* position for the screen display, and Line 90 re-sets the screen position for the bytes message of the main program.

Instead of just using *Save* "demo" as the direct command to *Save* this program, use *Save* "demo" *Line* 10 as the direct command. Stop the tape as soon as you get the OK message up on the screen. *New* the computer and then enter this program

```
10 REM prog
20 CLS
30 FOR b = 1 TO 234
40 PRINT "graphic 5 graphic 3 graphic 7"
50 NEXT b
60 PRINT AT 8,7 "Continue Program
70 FOR c = 1 TO 136
80 PRINT "graphic 7 graphic 7 graphic 7"
90 NEXT c
100 PRINT AT 21,30 "graphic 7 graphic 7
```

Again use *Save* "prog" *Line* 10 to *Save* this program immediately after "demo". Again this will auto *Run*, but while it is *Loading* the existing screen display created by the previous program will remain. The bytes message will come up at 20, 20, where the *Print* position was set to in the "demo" program. In this program Line 20 clears the existing screen display to make way for the new program. Neither do you need to overwrite the two programs, it is all right to start this program at, for example, 200, though you would of course have to use *Save* "prog" 200.

AMBER PRINTER

Len Garvey of Ickenham Road, Ruislip writes

Q **Is it still possible to buy an Amber printer? If so, do you know where I can get one?**

A I am not sure whether or not the actual printer is still being manufactured, but stocks are held by Letherby Numbering Systems. Their address is Letherby Numbering Systems, Central Way, Walworth Industrial Estate, Andover, Hampshire.

I would contact them for further details. The price is about £85.

BEWILDERED BY BINARY

Mr C McDonald of Fossetts Farm Ride, Stowmarket, Suffolk writes

Q **Please could you help? When it comes to computers I am generally progressing slowly but steadily, but I find the various types of numbering quite beyond me. I'm bewildered by Binary, perplexed by Hex, and even find myself becoming dim about Decimal. Please try and explain how and why we use these numbers?**

A You have my sympathy. It would take several pages to fully explain the theory and use of different number bases as they are called. Look at these three numbers 196, C4, 11000100. C4 — the Hexadecimal form — is the most succinct and would take up less memory, but when it comes to understanding the number, then 196 we recognise. But the computer only understands the Binary form. We have three numbering forms, one for us, one for the computer, and one other which seems to be a compromise.

To try and understand how all this works, let us start with what we know. The number 196 is made up of three columns: Hundreds, Tens, Units. However, the Hex system has only two columns to represent the same value, these are Sixteens and Units. The Binary has eight, 128s, 64s, 32s, 16s, 8s, 4s, 2s, and Units. (So it is easy to follow, I have given the column headings in Decimal.)

When it comes to translating a Binary number to Decimal we have to add all the columns with a 1 in, together. This gives us the sum of 4+64+128 = 196. While this is quite a simple sum, it is even easier in Hex. Firstly, Binary and Hex share some column headings, thus it is easier to break down the conversion of the numbers into simple sections. Every number in the Binary columns from Units to 8s inclusive, will be units in the Hex system. Every 1 in a column from 16s to 128s, will translate into the 16s in Hex. In our example there is just 4 in the units, so the first (units) column of the Hex has been worked out. There are no 16s, no 32s, one 64, which represents four 16s, and one 128 which represents eight 16s. With the units sorted out we are left with the sum of 4+8 = 12, or C in Hex. The two sums of 4, and 4+8 are much easier than one sum 128+64+4 = 196. The differences become more and more marked as the Binary becomes more complex. As most home computers have 16-bit addressing, imagine dealing with the Binary number 0111010011000110. Have a go — the column headings for the next eight columns are the powers of 2 up to 32 768. The Hex columns are every fourth column of the Binary.

It may well seem that the description of the translation of the Binary to Hex was more complex than that of Binary to Decimal, even if the sum at the end was easier. Remember, I had to translate the description into Decimal to make it understandable, such a thing as 128 column is in fact a Decimal number being applied to Binary heading. The computer does not have to do this translation, and so can convert Binary to Hex far quicker than it can to Decimal. Any number stored by a computer will always be in Binary, the extra space afforded by Hex, the relative ease with which it can be converted, plus the lesser demand for screen space all contribute to making Hex a far more ergonomic system when compared to Decimal.

SCROLLED SCREEN

P Bennett of Sarret Lane, Chorleywood, Hertfordshire writes

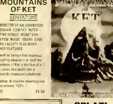
Q **I am having problems with my BBC computer in that I want to scroll the screen from left to right, can you please help me?**

A In essence what you have to do is access *Vdu* 23 directly, this allows you direct access to the 6845 screen chip. Concentrate on using registers 12 and 13, because these are the two that need changing. If you set the start of the screen memory higher than where it would normally start, you will get the effect of wrap around. A more detailed explanation would take several pages.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, 12-13 Little Newport Street, London WC2R 3LD



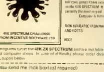
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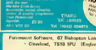
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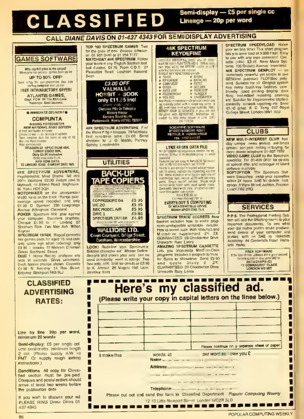
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SPECTRUM SOFTWARE for sale ZX Trek Black Crystal Time Gate Football Manager Champions 3D Graphics all £3 each ono Write to S A. Rowe 11 Trafalgar Way Billericay Essex CM12 0UT

SWAP SPECTRUM SOFTWARE — many new titles Atic Atac, Lunar Jetman Ant Attack. Tel John on 01-478 8884

MASSIVE SPECTRUM SOFTWARE sale All originals latest top games at up to 50 per cent off Send large sae for catalogue to B Croxford Ford Farm house Litton near Bath Somerset.

SPECTRUM GAMES for sale or swap Splat, Mazless Zzoom Ant Attack, Pyramid Football Manager Atic Atac Lunar Jetman and many others All at £2.50 each or swap for what have you? Tel 021-459 9641

SPECTRUM MICRODRIVE order form to highest bidder Tel Stevenage (0438) 351465 anytime.

MICRODRIVE and Interface I order forms to highest offer Any offers considered! Tel 0733 241 236 after 4 pm ask for Craig

SPECTRUM 48K DK Tronics keyboard original keyboard and documentation Alphacom printer Kempston Interface joystick all as new and in original packaging Including £125 of quality software £225 Tel Nottingham 663307

SWAP SPECTRUM 48K 2 joystick interfaces 1 and 2, and software for either Commodore 64 or BBC B Tel 4169658 evenings

SPECTRUM SOFTWARE Tasword Two £8 Frith £5 Aquaplane £3.50 3D Tunnel £2.50 Invaders £2 VU3D £5 Games Designer £6 Painter £3 Scrabble £8 Ant Attack £3.50 Zzoom £3 Chess £4 Tel Ferndale 731424

FOR SALE Spectrum manuals and Horizons tape £2.50 The Spectrum Handbook by Tim Langdell £2 Also Microdrive order form to highest offer Tel 0733 241 236 after 4 pm ask for Craig

SPECTRUM SOFTWARE FOR SALE. Ship of Doom £4 Planet of Death £3 Mad Martha £3 Orbiter £2 or swap all for Scrabble by Psion Tel 0492 79925

ZX PRINTER, with two rolls paper three months old £25 Tel Eastleigh (0703) 615340

ZX81s for sale

SWAP NEW 16K ZX81 hardly used cassette recorder few magazines plus £100 (cash) for BBC B Tel 254 8076 between 2 6 pm or after 8 pm Ask for Ford Will collect

ZX81 16K plus five ZX81 books plus nine software cassettes £40 Tel Ferndown (0202) 891686

16K ZX81 manual and leads very good condition Lots of software mags and books Tel Simon 01 202 0333

ZX81 PLUS 16K Ram Pack plus books and games 18 Mingle Place Boness West Lothian Scotland

ZX PRINTER plus 5 rolls of printer paper Mint condition £25 Tel Westbury (Wiltshire) 823281 after 6 pm

16K ZX81 plus over £100 worth of software Offer for £80 Tel Leysters (Hereford) 282

16K ZX81 plus software and books £40 ono Also ZX printer plus 5 rolls of paper £30 ono Tel 021-443 5480

SWAP ZX81 Ram Pack keyboard b/w TV plus software and books for 48K or consider 16K Spectrum Contact Steve 12 St Giles House Roman Road London E2 0RG

QUICKSILVA Sound and Mother board for ZX81 also Flight Simulation and 3D Defender tapes and Mastering Machine Code book £30 Tel Steve Bagshot (Surrey) 76843 (evenings)

ZX81 16K in box 2 tapes 2 books 8 mags value £95 for sale £55 Mr B Smallman 53 Cornbrook Park Road Old Trafford Manchester M15 4EH

ZX81 16K Ram Pack two months old guaranteed November 1984 Leads manual cassettes magazines books Learning to use the ZX81 Computer and Computer Battlegames. Sell for £50 0278 65275

Tandys for sale

TRS80 COLOUR COMPUTER Level 2 16K, two joysticks two games £110 Tel 01 940 7505

TRS80 EXPANSION INTERFACE and disc drives (Model 1) Also RS232 disk software etc wanted Tel (06462) 339 after 4 pm

TRS80 MODEL 1 Level 2 complete with expansion interface given 48K Ram also disk drive video screen 20 floppy disks and books Offers Tel Wrexham (0978) 262718 any time

TANDY 16K COLOUR COMPUTER with extended colour Basic five Rom packs cassette games one joystick, Panasonic cassette recorder 10 books All manuals and leads £150 Tel 01-624 6184 after 6 30 pm

IF YOU REQUIRE quality BBC hard copies send 50p and cassette H C D 22 The Square, Cutthorpe Chesterfield Post and packing free

COLOUR GENIE 16K Manuals leads and book three months old £100 also Dragon software hi-res cartridge £15 Oasis Forth £5 Quest £3 Empire £3 Berks area Tel 0735 20128

TANDY TRS80 colour computer and manuals £190 Tel 0827 873370

TANDY TRS80 16K L2 with a VDU and Rots software and books £190 ono Tel 01 521 0972 any time

For sale

EPSON RX80T 1? months old with serial interface lightly used for university project, must sell, going home Only £300 for both printer and interface Tel Othman Sidek on 061 881 1365 anytime

TI99/4A CASSETTE LEADS personal record keeping home management budget modules teach yourself basic cassettes plus manuals £120 or swap for Commodore 64K printer or disc drive Tel Farnborough Hants 611248

LYNX 48K, excellent condition including leads and manual etc Lynx user magazines includes software eg Space Invaders etc In box under guarantee £190 Tel 01-672 1738 after 8 pm

ORIC 48K. 3 months old with all leads manual still under guarantee games books 40 programs for Oric I including Zorgons Revenge Xenon I sell £105 Tel Hornchurch 42642 after 4 pm

GAMES software for Spectrum CBM 64 Vic20 over 40 per cent off rrp SAE for free catalogue Galactic Abductor free with first order Tel 01 521 7010

TEXAS TI99/4A and joysticks and cassette cable also parsec and chess modules various cassette programs and books worth £250 will take £100 Tel Warton 32109

SWAP 48K LYNX with cassettes books and Nilug membership for BBC compatible disc drive and DFS Rom Must be in good order or sell £175 Tel Kendal (0539) 28573 evenings

SWAP Racer and Astronic television game with Invaders cartridge for Oric 48K with manuals and leads. Tel 021-459 7063 (ask for Raymond) between 6 and 9 pm

VIDEO GENIE EG3003 16K fitted with 8 colo Rom and sound five manuals, service manual assorted level II books games tapes etc £100 demonstrated Tel Maidenhead 0628 23658

DISC DRIVES, pair Pertec 5¼ inch double sided £150 MPI 8 inch single sided £65 both with technical handbooks Tel Huntingdon (0480) 811020

Wanted

URGENTLY required Marconi teletwriter manual will exchange for Dragon light pen Tel (0453) 45515 evenings

HORRIBLY BORED VIC20 requires a super expander cartridge The Count adventure Rabbit's Escape MCP and Audiogenics Amok Tel 0558 822509

SWAP MY CHOPLIFTER cartridge (boxed) for Thorn EMI Submarine Commander cartridge (boxed) must not be copy Tel Luton 505840 ask for Clive after 4 30 pm

MISSION IMPOSSIBLE adventure to swap for any other adventure also Mole Attack to swap but I don't want Pirate Cove all for Commodore Vic20 Tel Broadstone 691206 after 6 pm

WILL SWAP 48K SPECTRUM plus printer plus Ferguson recorder plus £84 original software plus books cost £324 for Commodore 64 and recorder Tel 0206 22 3500 after 5 pm

SPECTRUM SOFTWARE TO SWAP, Ground Attack Gobble A Ghost Planet of Death Sentinel Black Hole Panik and Headerless copier Tel Bristol (0272) 569569 also Mined Out (and 16 and 48 issue o2)

SWAP ATARI ZORK 2 for Zork 1 or Zork 3 Tel 0724 845252.

SWAP SPECTRUM GAMES Derby Day Golf Football Manager Test Match all 48K for Spectrum business software not home banking or home accounts Tel Sheffield (0742) 482222 with offers

SWAP VIC20 Count Adventure for Sargon Chess Tel 01-660 3329 after 6 pm

SPECTRUM COMPUTER CASSETTE software wanted collector will purchase all types makers originals with cassette slips large collections preferred will collect (London area) full details first please telephone 01 520 0904

CBM 64 software Time Machine for Circuit, Escape Pulsar 7 or 10 Little Indians. Tel 0642 762475

SWAP VIC20 Pirate Cove for Mission Impossible Tel 0642 762475

WANTED SPECTRUM AGF programmable joystick interface in very good condition ZX printer 2 months old hardly used Tel T Rogers 0703-844058

NEW RELEASES

QUASI HERO



Hunchback was one of 1983's big arcade successes and it should therefore come as no surprise to discover that several versions of the game are now available for the main home micros

The game features Quasimodo the quasi hero attempting to rescue his beloved Esmeralda from her incarceration in a castle

This task involves 15 screens of action, each chock full of obstacles like knights, fiery pits, arrows and fireballs

The game is also available for the Spectrum 48K, Oric 48K, Electron, Dragon and Atari There is a choice of keyboard or joystick operation

Program *Hunchback*
Price *£6 90*
Micro *Commodore 64*
Supplier *Ocean Software*
Ralli Building
Stanley Street
Manchester M3 5FD

EXPANDED

Dodgy Dealer is a simulation game in which you are the boss of a small manufacturing company Armed only with a £5 000 bank loan, a warehouse and a three-year-old delivery van you must try to expand your company and make large profits

The game adopts the standard menu format and you make your financial decisions for a fixed trading period of years The game comes with a handy manual explaining the basic features of the game A nice additional touch is that the manual contains a special section containing detailed information on how to do well at the game which is sealed off from the rest of it, so that you can decide how much help you want

Program *Dodgy Dealer*
Price *£6 50*
Micro *BBC B 1.2 O/S*
Supplier *OIC*
15 Burghead Close
College Town
Camberley
Surrey GU15 4XL

WORD WRAP

Editext is a word processor for the Dragon 32 — one of around half a dozen currently available

This one comes from a new company Nectarine who are a spin-off from a publishing house — Foulsham

Editext has all the features you would seem to need in a word processor — at least for home use It will justify words and wordwrap at the edge of the screen You can move lines and paragraphs at will and search through your text to replace words and phrases

Assuming you use one of the major printers like an Epson FX80 you can also have your text printed out in various type faces Also included on the tape is a version of the program ready to be saved to disk — for major utilities like word processors this is an excellent idea and it would be nice to see more companies adopting it

Program *Editext*
Price *£12 95*
Micro *Dragon 32/64*
Supplier *Nectarine*
837 Yeovil Road
Slough SL1 4JH

ADDICTIVE

Plus ça change like a hardy perennial plant versions of the *Tron* light cycles duel abound for all the main home computers The reason for this is that the game is very addictive but easy to program thus for a budding software house development costs are slight

Lightcycles is the title of the latest version which runs on the BBC B

For those of you who have not seen the film or played any of the countless other versions the idea of the game is to move an arrow around the screen leaving a trail behind you using both speed and tactics you must try to block off your opponent's arrow forcing him to crash into either a wall or your trail In this version the computer controls your opponent

Program *Lightcycles*
Price *£6 95*
Micro *BBC B*
Supplier *Frean Systems*
Little Bealings
Woodbridge
Suffolk IP23 6LT

VAGUE FUN

Imagine Software have released two more titles for the 48K Sinclair Spectrum — *Alchemist* and *Stonkers*

Alchemist is another in the growing range of arcade games with adventure themes and objectives In this they are keeping pace with Ultimate, whose *Atic Atac* is currently topping the charts

Part of the fun (irritation) of *Alchemist* is that the instructions are deliberately vague, consequently you have very little idea of what you are doing and why

However, Imagine have thoughtfully provided us professionals with a crib sheet This reveals a number of features of the game you might otherwise miss, including some locations with excellent graphics

In fact, graphically this is probably the best game Imagine have produced — Ultimate finally has met its match

Program *Alchemist*
Price *£5 50*
Micro *Spectrum 48K*
Supplier *Imagine Software*
5 Sir Thomas Street
Liverpool
Merseyside L1 6BW

COMPLEX

Beware the savage jaw of *1984* programs I suspect that Orwell will have a lot to answer for in the months to come with 1984 sweat shirts, badges cuddly Winston Smiths and of course games

1984 from Incentive Software doesn't actually have much to do with the fabled book It is a complex simulation in which you must run the country for as long as possible — beginning in 1984 Can you succeed where others have failed?

Options within the game are vast, just like the real thing in fact, with each factor affecting all the others

Program *1984*
Price *£5 50*
Micro *Spectrum 48K*
Supplier *Incentive Software*
54 London Street
Reading RG1 4SQ

NO INCENTIVE?

Las Vegas Lady is a fruit machine simulation and part of the Spectrum software range from Mogul

I must admit that I've always thought it a bit pointless to simulate gambling machines

on a micro. With no cash payout, what's the incentive? Still I may be wrong; with the advent of things like nudges it is possible to play the odds and introduce some skill into the game.

This is one of the better fruit machine simulations and is the first one I know of with a gamble option, which is always my downfall on the real thing.

Program *Las Vegas Lady*
Price *£5.50*
Micro *Spectrum 48K*
Supplier *Mogul Communications, 90 Regent Street, London W1R 5PT*

FAR FUTURE

The silliest thing about the French language is the verbs which do all sorts of strange things as they move from the distant past to the far future.

Tense French is the, no doubt slightly tongue in cheek, title of a BBC B program from Sulis Software.

The program comes with 20 verbs and can test you on eight tenses — with you typing in your answers on the keyboard. Sulis have used the function keys to provide accents where appropriate.

Program *Tense French*
Price *£8.65*
Micro *BBC B*
Supplier *Sulis Software, John Wiley & Sons, Shripney, Bognor Regis, West Sussex PO22 9SA*

AUTO PILOT

The first flight simulation program for the Spectrum was not Psion's, but *Nightflight* from Hewson Consultants. The program, although quite impressive, was soon overshadowed by Psion's release with its faster responses and colour map.

However, now Hewson have retaliated with *Nightflight II* which fits into 16K. The graphics have been greatly enhanced over the original with a shifting perspective which shows runways, lights and surrounding villages. The sound has also been improved to emulate the sound of an engine throbbing.

There are various flight options including two autopilot modes and a training mode. The cassette insert folds out to several flaps of instructions which may be a little daunting but then presumably that just reflects the realism involved.

Program *Nightflight II*
Price *£7.95*
Micro *Spectrum 16/48K*
Supplier *Hewson Consultants, 60a St Mary's Street, Wallingford, Oxon OX10 0EL*

VISUALS

Computaslide is a set of three cassettes designed for the express purpose of enabling you to create slides for illustrating things like lectures, talks, etc.

The three cassettes are *Titles and Listings*, *Barcharts* and *Graphs*. Each enables you to construct a screen display on your television, using a series of user-friendly prompts which can then be photographed and turned into slides.

At £12 for each cassette, it's expensive and is presumably intended for business use — still the end results do look pretty impressive.

Program *Computaslide*
Price *£30 (or £12 each)*
Micro *Spectrum*
Supplier *Orange Enterprises, 20 Badby Road, Daventry, Northants*

SKI SKILL

Whatever the problems with the parent company, the independent Atari software suppliers seem to be growing in number.

The latest one calls itself Artworx and its first program is *Giant Slalom*. This is a skiing simulation in which you must guide a skier around a course consisting of open and closed slalom gates.

There are four levels of difficulty in the game with gates becoming narrower and speeds getting faster as you become more skilful.

The game requires one joystick and Basic cartridge and, although it is hardly original in concept, it is at least seasonal.

Program *Giant Slalom*
Price *£7.50*
Micro *Atari 16K*
Supplier *Artworx, Alitren Data Services, 100a Uxbridge Road, Hayes, Middx UB4 0RL*

ADDLED BRAIN

Salamander is continuing to release Jeff Minter's excellent Vic programs for the Dragon 32 — next is *Laser Zone*.

As is usual for Jeff's games, the basic idea behind laser zone is the classic "zap as many aliens as you can" format. But the implementation of this idea has been done in such a way as to addle the brain and numb the fingers.

In *Laser Zone* you have two laser bases to control — one patrols the up and down axis, the other moves across the bottom of the screen.

The aliens come thick and fast, and there are 32 levels to the game — the case cassette box comes with some useful advice on tactics. This includes mastering the "diagonal fire technique", using one laser base to defend the other.

Program *Laser Zone*
Price *£7.95*
Micro *Dragon 32*
Supplier *Salamander Software, 17 Norfolk Road, Brighton BN1 3AA*

A REAL GEM

A pearl among swine. Diamond, hardest private investigator in the world, is grinding away at another case. It's a tough nut to crack.

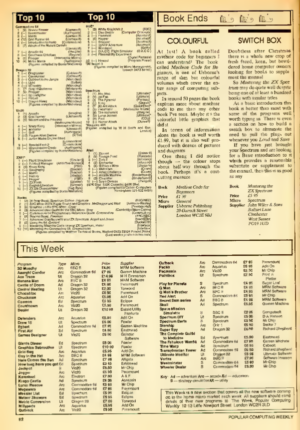
In *Fishy Business* the world weary sleuth finds himself washed ashore like so much driftwood on a desert island — except this ain't no south seas paradise. Some of the natives are about as friendly and as understanding as Caligula.

If you've followed through all his adventures, *Franklin's Tomb* and *Lost in Space*, then you'll find a few mysterious loose ends tied up in *Fishy Business*.

As usual the program comes with a series of case notes illustrating many of the scenes and locations you'll come across.

Program *Fishy Business*
Price *£9.95*
Micro *Dragon 32*
Supplier *Salamander, 17 Norfolk Road, Brighton BN1 3AA*

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



Top 10

Commodore 64

1	(9)	Hover Bovver	(Llamasoft)
2	(—)	Gatemaster	(Audiogenic)
3	(—)	Matrix	(Llamasoft)
4	(10)	Grid Runner 64	(Llamasoft)
5	(—)	Introduction to Basic	(Commodore)
6	(7)	Attack of the Mutant Camels	(Llamasoft)
7	(—)	Arcadia 64	(Imagine)
8	(—)	Goodness Gracious	(Beyond)
9	(1)	Frogger	(Interceptor Micros)
10	(4)	Motor Mania	(Audiogenic)

(Figures compiled by Boots/Websters)

Dragon 32

1	(—)	Dragrunner	(Cabletoft)
2	(—)	Caverunner	(Cabletoft)
3	(—)	Cuthbert in the Jungle	(Microdeal)
4	(—)	Ugh!	(Softek)
5	(—)	Scramble	(Microdeal)
6	(7)	Ring of Darkness	(Wintersoft)
7	(6)	Frogger	(Microdeal)
8	(—)	Speedfighter	(Microdeal)
9	(—)	Pinball	(Microdeal)
10	(—)	Dragon Hawz	(Microdeal)

(Figures compiled by Boots/Websters)

Vic20

1	(1)	Arcadia	(Imagine)
2	(3)	Grid Runner	(Llamasoft)
3	(5)	Wizard and the Princess	(Melbourne House)
4	(—)	Krazy Kong	(Interceptor Micros)
5	(—)	andrator	(Llamasoft)
6	(—)	Golf	(Audiogenic)
7	(10)	Plague Alien Demon	(K-Tel)
8	(—)	Junior Master Engine Shed	(Commodore)
9	(—)	Special Pack 2	(Commodore)
10	(—)	Grandmaster Chess	(Audiogenic)

(Figures compiled by Boots/Websters)

ZX81*

1	(—)	Flight Simulation	(Sinclair)
2	(—)	Football Manager	(Addictive Games)
3	(9)	Krazy Kong	(PSS)
4	(—)	Geography	(Sinclair)
5	(—)	Maths	(Sinclair)
6	(—)	History	(Sinclair)
7	(—)	Hopper	(PSS)
8	(—)	ZX Form	(Sinclair)
9	(—)	English Literature	(Sinclair)
10	(—)	ZX DB Disassembler	(Bug Byte)

(Figures compiled by Boots/Websters)

BBC*

1	(3)	White Knight Mk 2	(BBC)
2	(—)	Disc Doctor	(Computer Concepts)
3	(—)	Planetoid	(Acornsoft)
4	(5)	Hopper	(Acornsoft)
5	(—)	Snapper	(Acornsoft)
6	(—)	Sphinx Adventure	(Acornsoft)
7	(—)	Wordwise	(Griffin)
8	(—)	D.A.C.C. Flight Simulator	(D.A.C.C.)
9	(—)	Pleasability Experiment	(Digital Fantasia)
10	(—)	Hexzel	(Program Power)

*All Issue I 0

(Figures compiled by Micro Management, Ipswich 0473 59181)

Spectrum

1	(1)	Atic Atac	(Ultimate)*
2	(9)	Jet Pac	(Ultimate)
3	(3)	The Pyramid	(Fantasy)
4	( )	Kong	(Ocean)*
5	( )	3D Ant Attack	(Quicksilva)*
6	(5)	Penetrator	(Melbourne House)
7	(4)	The Alchemist	(Imagine)
8	(2)	Lunar Jetman	(Ultimate)*
9	(8)	Pool	(CDS)
10	( )	Harrier Attack	(Durell)

*Requires 48K

(Figures compiled by W H Smith and Son London)

Atari

1	(1)	Zaxxon	(Datasoft)
2	(9)	Savage Pond	(Starcade)
3	(—)	Zork II	(Infocom)‡
4	(2)	Enchanter	(Infocom)†
5	(6)	O'Riley's Mine	(Datasoft)
6	(—)	Mohtown	(Cosmi)
7	(—)	Aztec Challenge	(Cosmi)
8	(—)	Arcade Machine	(Broderbund)‡
9	(3)	Choplifter	(Broderbund)‡
10	(—)	Spy's Demise	(Penguin)

‡32K Disc †32K Cassette §48K Disc

(Figures compiled by Calisto Computers Birmingham 021-632 6458)

Books

1	(2)	30 Hour Basic Spectrum Edition *Prigmore*	(BBC/NEC)
2	(1)	BBC Micro Book: Basic Sound and Graphics *McGreggor and Watt*	(Addison-Wesley)
3	(6)	Graphics on the BBC Micro *Cryer*	(Prentice-Hall)
4	(3)	Advanced User Guide for the BBC Micro *Bray*	(Cambridge Micro Centre)
5	(—)	Commodore 64 Programmers Reference Guide *Commodore*	(Commodore)
6	(8)	Beyond Basic *Freeman*	(BBC/NEC)
7	(—)	Advanced Graphics with your ZX Spectrum *Angell and Jones*	(Macmillan)
8	(5)	Using the 64 *Gerrard*	(Duckworth)
9	(—)	Mastering Machine Code on your ZX Spectrum, *Baker*	(Interface)
10	(10)	Mastering the Commodore 64 *Greenshields*	(Interface)

(Figures compiled by Watford Technical Books, Watford 0923 23324 Prestel 29844)

(Last week's position in brackets)

Book Ends

COLOURFUL

At last! A book called machine code for beginners I can understand! The book called *Machine Code for Beginners*, is one of Usborne's range of slim but colourful volumes which cover the entire range of computing subjects.

In around 50 pages the book explains more about machine code to me than any other book I've seen. Maybe it's the colourful little graphics that did it.

In terms of information alone the book is well worth £1.99, but it is also well produced with dozens of pictures and diagrams.

One thing I did notice though — the colour stops about half way through the book. Perhaps it's a cost-cutting measure.

Book *Machine Code for Beginners*
Price *£1.99*
Micro *General*
Supplier *Usborne Publishing 20 Garrick Street London WC2E 9BJ*

SWITCH BOX

Doubtless after Christmas there is a whole new crop of fresh faced, keen, but bewildered home computer owners looking for books to supplement the manual.

So *Mastering the ZX Spectrum* may do quite well despite being one of at least a hundred books with similar titles.

As a basic introduction this book is better than most with some of the programs well worth typing in. There is even a section on how to build a switch box to eliminate the need to pull the plugs out whenever you *Load* and *Save*.

If you have just brought your Spectrum and are looking for a Basic introduction to it which provides a reasonable substitute or supplement to the manual, then this is as good as any.

Book *Mastering the ZX Spectrum*
Price *£5.95*
Micro *Spectrum*
Supplier *John Wiley & Sons Baffins Lane Chichester West Sussex PO19 1UD*

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
3D Munchy	Arc	BBC B	£4.95	MRM Software
Aargh! Condor	Arc	Commodore 64	£7.95	Games Machine
Ace Trace	Ut	Dragon 32	£14.95	M H Emmerson
Banana Man	Arc	BBC B	£4.95	MRM Software
Castle of Doom	Ad	Dragon 32	£6.90	Paramount
Central Heating	Ut	Dragon 32	£7.00	Torwood
Chocabloc	Arc	Vic20	£6.50	Paramount
Chuckman	Arc	Aquarius	£5.95	Add On
Cosmos	Ed	Spectrum	£5.95	Eclipse
Countdown	Arc	Vic20	£5.50	Paramount
Dataid	Ut	Dragon 32	£10.98	Dataid Utility Products
Defenders	Arc	Aquarius	£5.95	Add On
Draw 15	Ut	Spectrum	£5.00	Fowler
Egbert	Arc	Commodore 64	£7.95	Games Machine
First Aid	Ed	Spectrum	£4.50	Eastmead
Games Designer	Ut	Vic20	£8.50	Galactic Software
Giants Dinner	Ed	Spectrum	£5.95	Fowler
Graphics Subroutine	Ut	Spectrum	£10.00	Fowler
Grid Bug	Arc	Aquarius	£5.95	Add On
Guy in the Hat	Arc	BBC B	£4.95	MRM Software
Here Comes the Sun	Ad	Spectrum	£7.95	Alligata
How long have you got	Ed	Spectrum	£3.45	Eastmead
Jackpot	S	Vic20	£5.50	Mr Chip
Jogger	Arc	Vic20	£5.50	Paramount
Kamakazi	Arc	Electron	£7.90	A & F
Kingo Castle	Ad	Spectrum	£6.95	Assassin
Lunar Rescue	Arc	Commodore 64	£5.99	Mr Chip
Megawars	Arc	Commodore 64	£7.95	Paramount
Messier List	Ed	Spectrum	£5.95	Eclipse
Meteor Showers	Ed	Spectrum	£5.95	Eclipse
Metric Conversion	Ut	Dragon 32	£7.00	Torwood
Millypede	Arc	Aquarius	£5.95	Add On
Outback	Arc	Vic20	£5.50	Paramount
Outback	Arc	Commodore 64	£7.95	Paramount
PacMr	Arc	Aquarius	£6.95	Add On
Pacmania	Arc	Vic20	£6.50	Mr Chip
Paintbox	Ut	Spectrum	£7.50	Print 'n Plotter
Play for Planets	S	Spectrum	£4.95	Sugar Loaf
Q Man	Arc	BBC B	£4.95	MRM Software
Q Man's Brother	Arc	BBC B	£4.95	MRM Software
Red Alert	S	Commodore 64	£5.95	Mr Chip
Secret Sam series	Ad	BBC B	£4.95	MRM Software
Skull	Ad	Spectrum	£6.95	Games Machine
Space Mission Simulator	S	BBC B	£2.95	Computsoft
Spectrum DIY	Ut	Spectrum	£5.00	D A Hanson
Spectrum Darts	S	Spectrum	£5.50	Mr Chip
Starship	Arc	Oric 1	£5.50	Sector 7
Super Spy	Ad	Dragon 32	£6.50	Richard Shepherd
The Complete Guide to Medicine	Ed	Spectrum	£5.90	Eastmead
The Fabulous Wanda	Ad	Commodore 64	£7.95	Games Machine
Time Warp	Ad	Spectrum	£6.95	Cabsoft
Transylvanian Tower	Ad	Commodore 64	£6.50	Richard Shepherd
Ultimate Monitor	Ut	Dragon 32	£5.95	Ultimate Software
Vortex	Arc	BBC B	£7.95	Software Invasion
Westminster	S	Commodore 64	£5.50	Mr Chip
Wheeler Dealer	S	Commodore 64	£5.50	Mr Chip

Key: **Ad** — adventure **Arc** — arcade **Ed** — education **S** — strategy-simulation **Ut** — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week, Popular Computing Weekly 12-13 Little Newport Street London WC2R 3LD



Bigger and better?

Over the last few months there have been significant transformations in both the packaging and marketing of home computer software.

Originally software came in nice practical little cassette cases which took up very little space on the shop shelves and at home. The rot seems to have started when some software houses decided to put their cassettes into slightly larger boxes which looked rather more impressive. This was not too unreasonable because these cases were rather more durable than the standard brittle cassette cases. They did not take up much more space, whilst at the same time they gave the manufacturer more room to provide illustrations and instructions.

However, recent visits to the local stockists have revealed that the marketing departments have now clearly got the bit between their teeth and the current trend in software appears to be to produce bigger and better packaging. Using the original cassette case is now almost unheard of, unless it is buried deep in cardboard and polystyrene!

As long as the original case was retained inside you could always throw away the unnecessary rubbish, but at least one major company has recently opted for full sized video cassette boxes which have enough space for a cassette, a cartridge, a disc and a reasonable manual. However, in practice, the offerings to date have only contained either a cartridge or a cassette, and a very slim information booklet. All this may look very pretty in the shop but is it really rational, and how much does it add to the cost?

Some quick work with a ruler reveals the extent of the empty space being sold (about 90 per cent of the entire product), for which of course space must be found on your own shelves (although if prices are forced to rise you won't be able to afford many). Certainly there has been some resistance to grandiose packaging from the poor retailer who must find room to display his stock, but even the giant chains now seem to have been successfully wooed by the claims of the promotion experts that this approach will increase their sales.

Perhaps this type of packaging is justified for an item of serious software on cartridge together with a demonstration cassette and a comprehensive manual, but surely it is totally unnecessary for the average game.

At the same time there have been significant changes in advertising practices as big business has realised that 'there is gold in them there games' and expended vast sums on full colour, full-page promotions of pretty mediocre software which may not even have been written when the advert was designed!

The 'new' idea of putting different games on each side of the cassette sounds suspiciously like the old 'games packs' which often tried to make up in quantity what they lacked in quality. A really first-rate game should stand on its own feet and not have to be propped up from the other side. In the past some very good software has appeared in third rate packaging and has succeeded on its own merits by personal recommendation and with minimal advertising.

While the industry spokesmen continually complain about 'personal pirating' of their products by users, it seems that the same standards do not apply when it comes to 'ripping off' a novel idea from a small company that cannot afford to fight. Hopefully such aggressive marketing techniques will not drive the small and original producers out of the market place.

Users should be extremely wary when buying software and always remember that it is ultimately the content rather than the container or the claims that is important! ■

Keith and Steven Brain

Puzzle

Pot black

Puzzle No 91

You may have seen Cliff Thorburn's maximum snooker break on television.

He scored 147 taking all the reds each time with the black and then all the colours.

On another planet, in another galaxy, an altogether more complex version of snooker is practiced. A larger number of balls are used although the reds are still placed in a triangular frame at the start, the reds are worth one and the colours score 2, 3, 4 and so on, up to the most valuable.

If there are less than 100 reds and less than 100 colours with a maximum break of 11 702 then how many reds and colours are there?

Solution to Puzzle No 86

The number of jewels present must have been in the form of a 'triangular' number in order to fit the arrangement shown. Triangular numbers are those in the series

1 + 2 + 3 + 4 + 5 + 6 + ... + n

where each term is a successive integer, ie 1 3 6 10 15 21 ... The first layer will contain one jewel, the second layer two jewels, and so on.

We need to find a triangular number which, if divided by 40, will leave a remainder of one. There are an infinite number of these but we only need to find the smallest. The program generates successive triangular numbers and then tests each to determine if one less than this number is exactly divisible by 40.

```
10 LET T = 0 20 LET N = 1 30 LET T = T + N 40 IF (T-1)/40 = INT((T-1)/40) THEN GOTO 100 50 LET N = N+1 60 GOTO 30 100 PRINT N, T
```

This shows that 561 jewels could be arranged in a triangle with 33 layers. By leaving one jewel the remaining 560 are exactly divisible by 40, giving each thief 14 jewels each.

Winner of Puzzle No 86

The winner is John South, Deans Close, Bexhill-on Sea, East Sussex, who receives £10.




AUTOMATA
GROUCHO – the Pimania sequel
Spectrum 48K £11
PI-EYED – the comedy, cartoon arcade game starring the PiMan
Spectrum 48K £6
PI BALLED
Spectrum 48K £6
MORRIS MEETS THE BIKERS – exciting arcade fun
Any Spectrum £6
YAKZEE
Dragon 32 plus Spectrum 48K £5
GO TO JAIL – Play the game
Spectrum 48K £6
THE PIMAN'S GREATEST HITS
I ENCLOSE THE RIGHT MONEY OR DEBIT MY ACCESS/VISA CARD
CARD NUMBER
MY SIGNATURE
MY NAME
MY ADDRESS
POST CODE
AUTOMATA U.K. LTD
27 Highland Road Portsmouth Hants. PO4 9DA
A BIG BUNCH OF NICE PEOPLE - FROM SOFTWARE CHIEFS TO MEMBERS OF THE COMPUTER USING PUBLIC - WHO HAVE ALREADY GIVEN THEIR SUPPORT IN AUTOMATA'S LEGAL PUNCH UP, HAVE EXTENDED THAT SUPPORT IN THE SEARCH FOR THE PIMAN, WHO HAS GONE OUT ON A CRIPPLING BENDER. THEY HAVE ARRANGED TO APPEAL TO HIM TO COME HOME ON TELEVISION - NOT KNOWING THAT HE HAS LOST NOT ONLY HIS DIGNITY, BUT HIS MEMORY. THIS WHOLE STRIP IS PRETTY WORDY TODAY SO WATCH OUT!
DO YOU HAVE TO WATCH THAT? I WAS HOPING TO SEE DALLAS!
IT'S MY HOUSE MY TELLY AND I'M WATCHING THE APPEAL! DALLAS INDEED
WELL I GUESS I'LL TAKE THESE MOULDY ONIONS BACK TO THE COMPOST HEAP!
GO ON - TRY AND SUE ME IF YOU DO, I'LL SUE ELLEN! I'M ENTITLED TO MY ONIONS, AND MY SOLICITOR'S DAD CAN BEAT YOUR SOLICITOR'S DAD, AND YOU CAN'T EVEN BEAT AN EGG WITHOUT MAKING A DRAMA OF IT. YOU MIGHT AT LEAST MAKE AN OMELETTE
WILL YOU STOP HOGGING THE STRIP AND SIT DOWN?!
IF YOU'RE THE PIMAN, OR YOU'VE SEEN HIM AROUND, PLEASE RING THAT NUMBER OR CALL AT CHEZ PI. FOR THOSE OF YOU WHO AREN'T THE PIMAN BUT HAVE SEEN HIM THE ADDRESS IS
ARE YOU STILL HOGGING THE STRIP?
NO I'M STRIPPING
HE'LL COME HOME! IF HE KNOWS WE ALL FORGIVE HIM, IT'LL BE ALL RIGHT! WE CAN START AFRESH
I COULD START A FRESH RIGHT NOW! I COULD START TWO FRESHES!
AND THE VERY NEXT MORNING, LADY CLAIR IS AWAKENED BY A FRENZIED HAMMERING AT THE DOORBELL
IT'S IM!
COMING!
KER-UMSS! WHO'RE YOU MEANT TO BE?
I'M THE PI MAN
YOU HAVEN'T! YOU'RE A BIG PHONEY!
PIMAN
I'M OVER HERE, CLAIR
I'VE RETURNED TO SHARE YOUR AFFECTION AND MONEY
IMPOSTER!
ENTER FIDO EXIT 41 PIMAN IMPERSONATORS
GRR I'LL HAVE YER LEG OFF FOR YER
I HOPE HE CATCHES ONE WE'LL SAVE ON DOGMEAT!
BUT WE STILL DON'T KNOW WHERE PIMAN IS!
PIMAN AT THAT VERY MOMENT, LAY AMONG THE DUSTBINS IN AN ALLEY - AMNESIC COLD, HUNGRY, HUNG-OVER AND FRESHLY MUGGED BUT WHAT IS THIS..?
PIMAN YOU TREAT FRIENDS AND SELF VERY BADLY - TIME TO FACE LIFE AGAIN - REGAIN SELF-RESPECT AND THE RESPECT OF LOVED ONES COOKIE
I... I REMEMBER THAT VOICE... IT'S
YES
IT'S BENNY HILL!
NO SILLY SAUSAGE IS OLD BUDDY YAKZEE YAK, MAKING SPECIAL ASTRAL APPEARANCE AS PIMAN'S BEERY BREATH TOO MUCH TO TAKE! NOW PREPARE YOURSELF FOR MYSTICAL ORDEAL IN OTHER DIMENSION!!
HANG ON I'M NOT SURE I WANT I MEAN WAIT
ONE ZAP LATER
WHERE AM I?
NEXT TIME PI-BALLED!
10th ZX MICROFAIR
48K SPECTRUM DISC DRIVES IN STOCK £260 INCLUDING SECURICOR DELIVERY !!!